NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES ALTERATION OF TERRAIN APPLICATION

for

Hudson Logistic Center
43 Lowell Road
Hudson, New Hampshire

Prepared For:

Hillwood Enterprises, L.P.
5050 w. Tilghman Street, Suit 435
Allentown, PA 18104

Prepared By:

Langan Engineering & Environmental Services, Inc.
888 Boylston Street, Suite 510
Boston, MA 02199

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June 2020
Revised: September 2020
Langan Project No. 1510101

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UNBOUND, LOOSE DOCUMENTS

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PROJECT NARRATIVE

This Alteration of Terrain Application has been prepared in support of the proposed development of approximately 367 acre site located at 43 Steele Road in the Town of Hudson New Hampshire. The existing two parcel site is currently developed as a 39 hole golf course known as Green Meadow Golf Club and is accessed from Steele Road. The existing topography on the site exhibits significant grade changes of up to 90 feet in elevation change. Many high and low points, and rolling topography can be found on site.

The proposed development is the construction and operation of three distribution warehousing facilities known collectively as the Hudson Logistics Center. Three Lots A, B, and C and a subdivision road way will be create from the existing two parcel site. Lot A will include the construction of a ±1,079,660 sf building with a finished floor elevation ±141.75 feet, Lot B will include the construction of a ±1,005,480 sf building with a finished floor elevation of ±147.5 ft, and Lot C will include the construction of a ±529,844 sf building with a finished floor elevation ±149.50 feet. The current access from Steel road is unable to support the facilities as the main access road. A right of way will be created and new access road constructed for the development. A secondary access is also proposed in the north east section of Lot A. Upgraded utility service lines will be brought to the site within the proposed right of way.

Hydrologically, the site is located in the Merrimack River watershed, which is approximately 5,014 square miles, of which the project site encompasses a nominal amount of approximately 0.075%. The site is part of the Limit Brook – Merrimack River sub-watershed which encompasses approximately the southern three quarters of the Town of Hudson. Under the proposed conditions, the majority of the developed site will drain through closed pipe networks to the stormwater treatment systems before discharging off site at a controlled rate. Existing drainage patterns are being maintained to the greatest extent possible.

The proposed stormwater management system has been designed in accordance with the Town of Hudson current, and soon to be adopted, requirements, the New Hampshire Stormwater Manual, and the New Hampshire Department of Environmental Services. The system incorporates elevated levels of stormwater quality, maintains or decreases the existing peak rate of runoff for all storm events analyzed, and provides above the required groundwater recharge volumes.

Peak Flow Analysis

The project site directs stormwater run-off to two analysis locations under the existing conditions. Watershed A discharges run off directly to the Merrimack River along the western Property line via sheet flow or pipe discharge. Watershed B discharges run off, to wetland systems running north to south through the eastern region of the property west of Lowell Road. This wetlands system includes portions of an unnamed stream to the north and portions of Limit Brook to the south. Both of which ultimately discharge to the Merrimack River.

The proposed watershed analysis utilizes the same two discharge locations under the existing conditions, A and B. The outer limits and overall area analyzed under the proposed conditions is consistent with the existing conditions. Having consistent analysis of overall areas and discharge locations between the existing and proposed conditions ensures the model represents an accurate pre and post construction run off comparison.

The proposed stormwater management plan, discussed in the attached stormwater management report, results in a net reduction of peak offsite flows from watershed A and B. While the impervious area on site will increase, stormwater BMPs have been sized to not only meet but exceed the current regulations for stormwater treatment, flow attenuation and groundwater recharge requirements.

The table below provides a comparison of the peak run off rates from the pre development state to the post development state. Flow comparison is provided for the 2, 10, 25, and 50 year storm events and the percentage reduction in flow is listed for each instance.

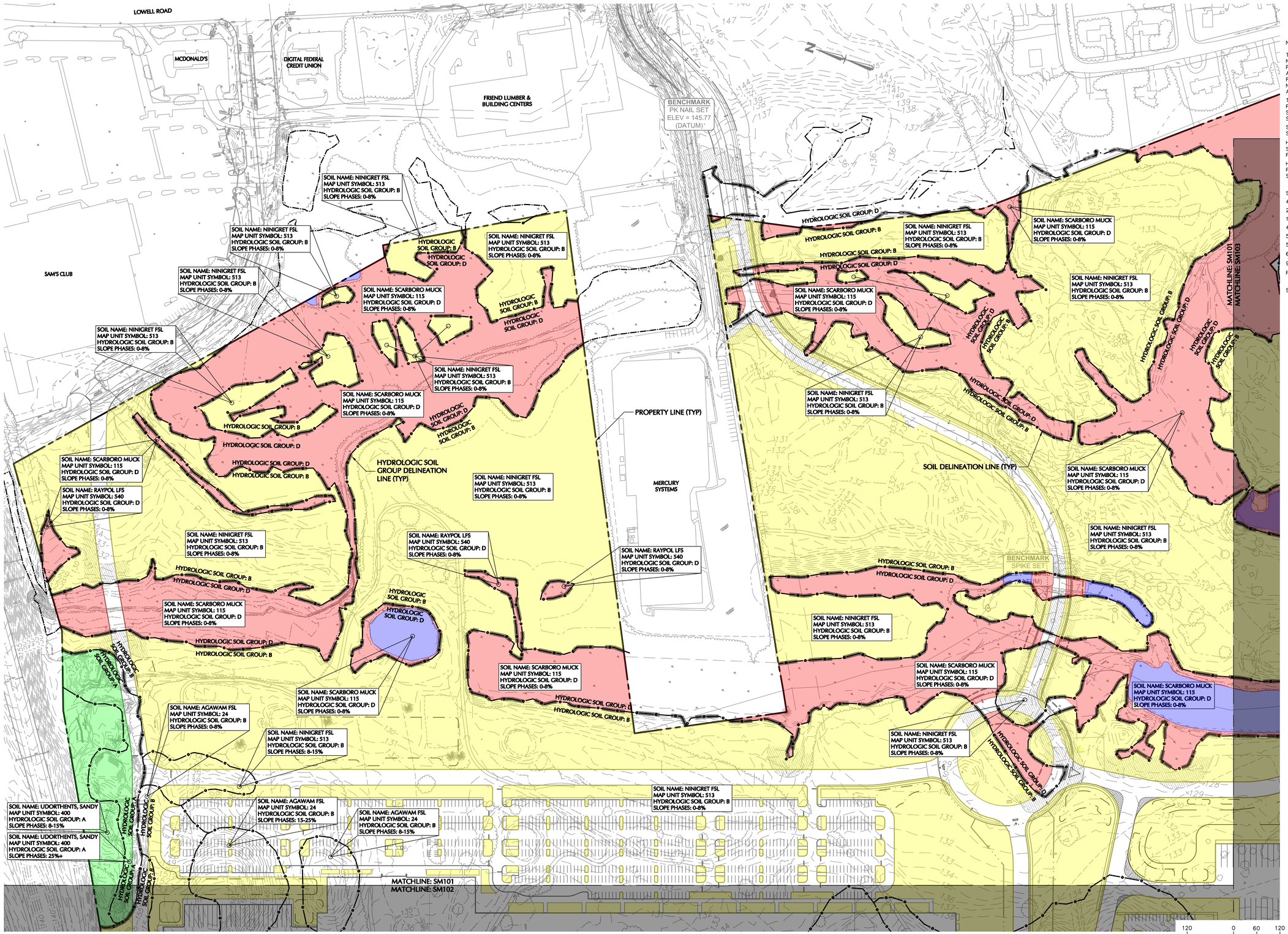
Table : Peak Flow Runoff Rate Comparison (cubic-feet per second)

		FLOW (CFS)			
		2-year	**10-year**	**25-year**	**50-year**
A	Pre	29.03	121.42	206.34	297.64
	Post	12.97	58.00	99.39	143.14
	Delta	**-55.32%**	**-52.23%**	**-51.83%**	**-51.91%**
B	Pre	55.48	228.29	363.62	471.49
	Post	43.16	155.21	239.80	306.40
	Delta	**-22.21%**	**-32.01%**	**-34.05%**	**-35.01%**

For a more detail explanation of the site watershed and peak flow analysis, please refer to the attached stormwater management report. Stormwater quality, features, conveyance and ground water recharge calculation for the project can also be found in the attached stormwater management report.

Complete Set of Design Drawings
(Under Separate Cover)

Site Specific Soil Map Plan Proposed Color



NOTE:

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL SURVEY WAS PRODUCED MAY 4, 2020, AND WAS PREPARED BY JAMES P. GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC. THE LOCATION OF THE SOIL SURVEY IS AT LOWELL AND STEELE ROADS IN HUDSON, NH.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011.

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4	POOTATUCK VFSL	371	B
24	AGAWAM FSL	211	B
115	SCARBORO MUCK	611	D
400	UDORTHENTS, SANDY	211	A
513	NINIGRET FSL	311	B
540	RAYPOL LFS	511	D
699	URBAN LAND	N/A	IMPERVIOUS
917	NINIGRET VARIANT (SWPD)	411	C
PONDS	OPEN WATER	N/A	N/A

SLOPE PHASES: 0-8% = B 8-15% = C 15-25% = D 25%+ = E

LEGEND	
PROPERTY LINE	
SOIL DELINEATION LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
HYDRAULIC SOIL GROUP A	
HYDRAULIC SOIL GROUP B	
HYDRAULIC SOIL GROUP D	
IMPERVIOUS	
SURFACE WATER	

Date	Description	No.
Revisions		

Signature Date

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Project

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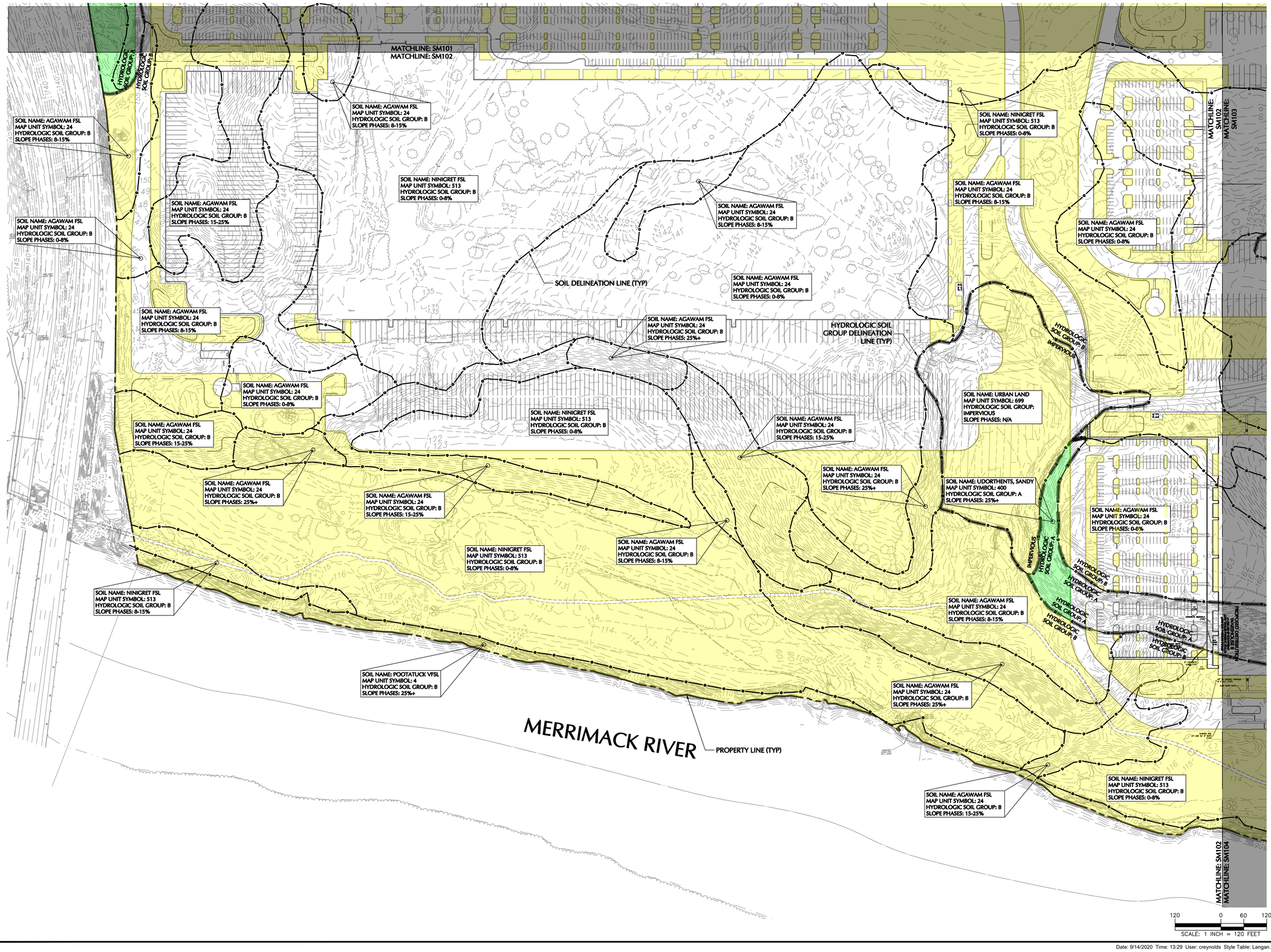
HUDSON NEW HAMPSHIRE

Drawing Title

SITE SPECIFIC SOIL MAP PLAN I PROPOSED COLOR

Project No.	Drawing No.
151010101	SSSM101 PR
Date: 05/22/2020	
Drawn By: RJS	
Checked By: NLK	Sheet 23 of 10

LANGAN Project No. 151010101



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SITE SPECIFIC SOIL MAP PLAN II PROPOSED COLOR

Project No.	Drawing No.
151010101	SSSM102 PR
Date: 05/22/2020	
Drawn By: RJS	
Checked By: NLK	Sheet 24 of 10

LANGAN Project No. 151010101

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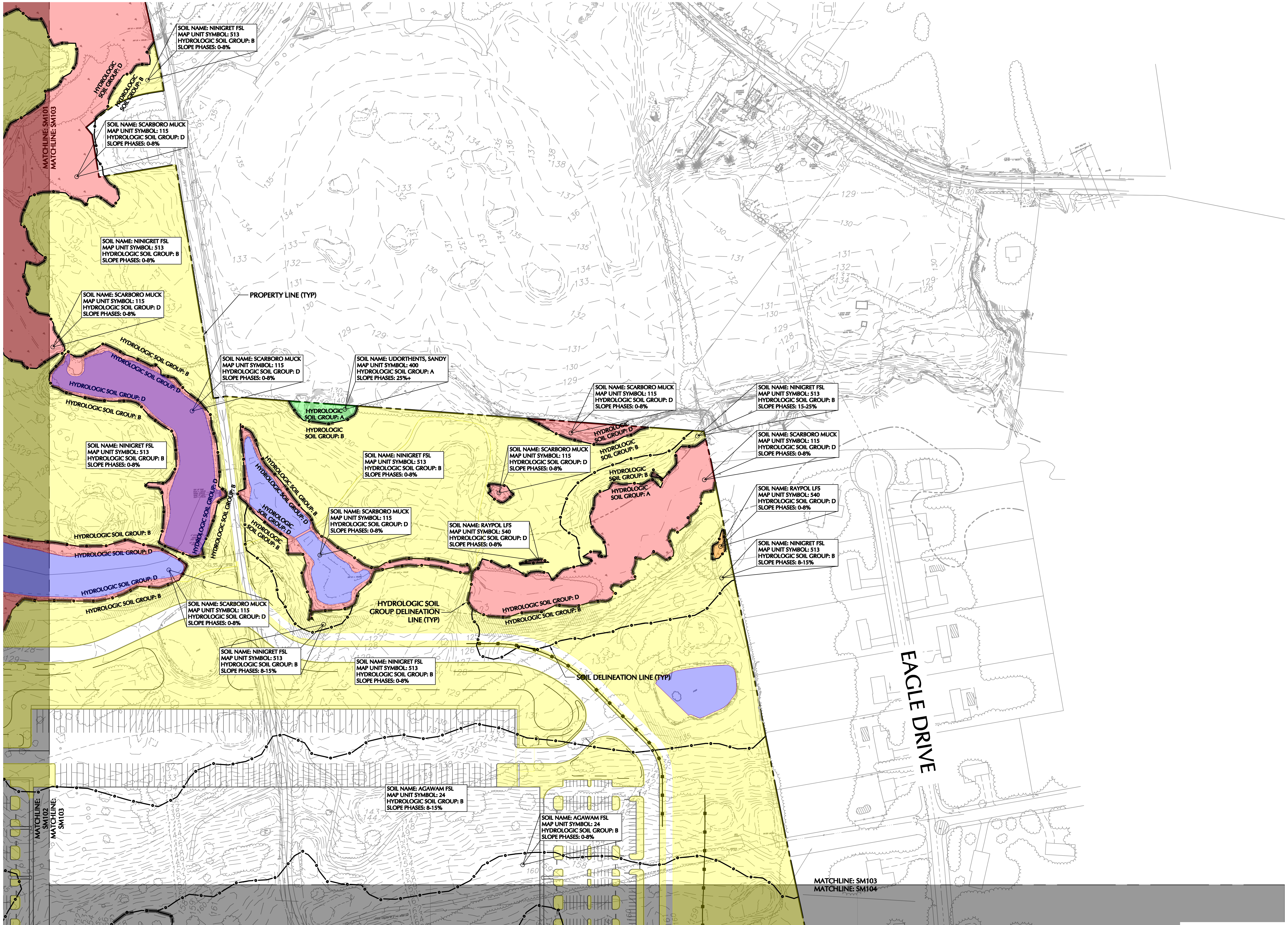

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Date	Description	No.

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Drawing Title

SITE SPECIFIC SOIL MAP PLAN III PROPOSED COLOR

Project No. 151010101

Date 05/22/2020

Drawn By RJS

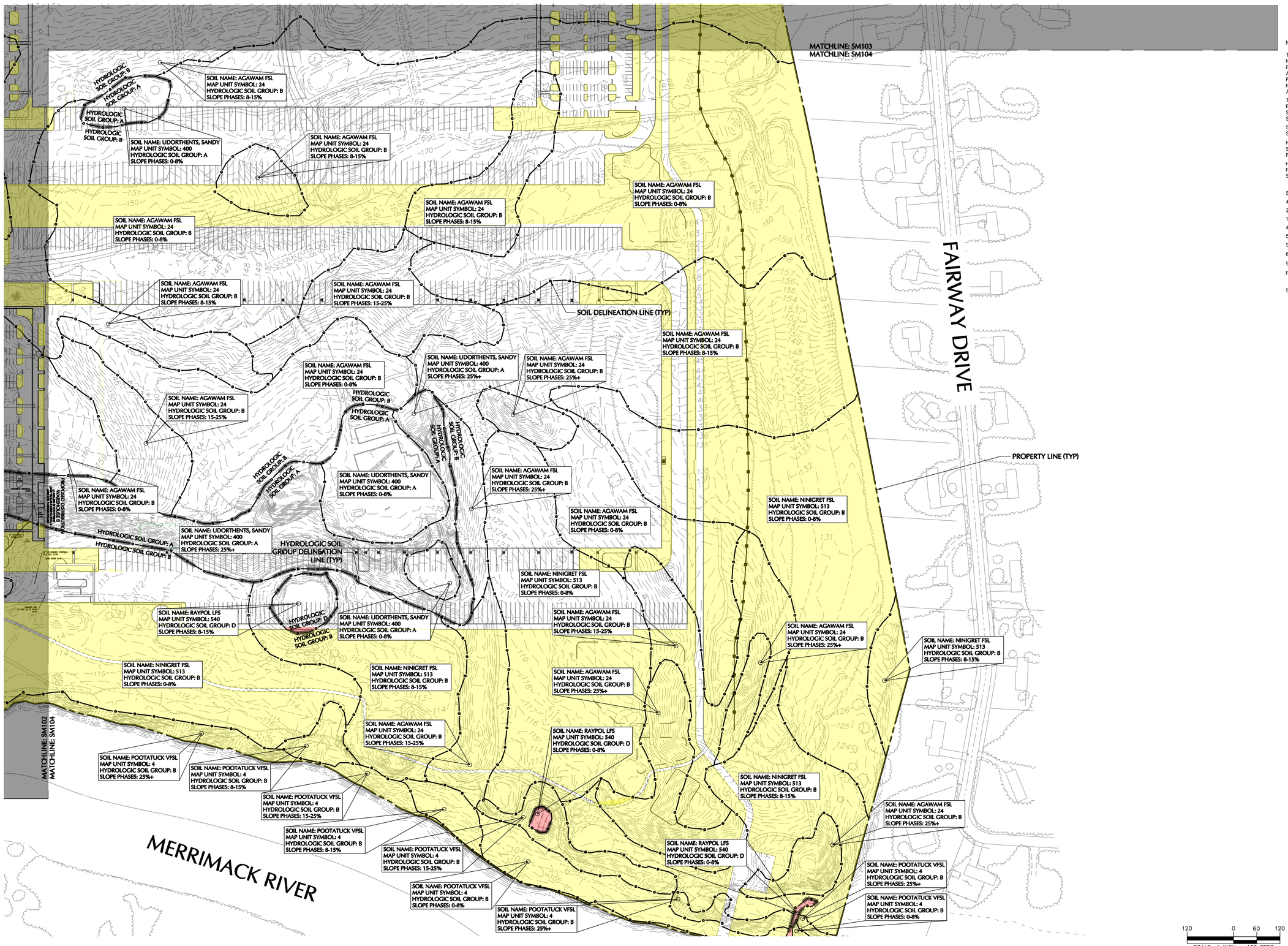
Checked By NLK

Drawing No. SSSM103 PR

Sheet 25 of 10

SCALE: 1 INCH = 120 FEET

LANGAN Project No. 151010101



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HYDRAULIC SOIL GROUP A	
HYDRAULIC SOIL GROUP B	
HYDRAULIC SOIL GROUP D	
IMPERVIOUS	
SURFACE WATER	

120 0 60 120
SCALE: 1 INCH = 120 FEET

Date	Description	No.
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HUDSON NEW HAMPSHIRE

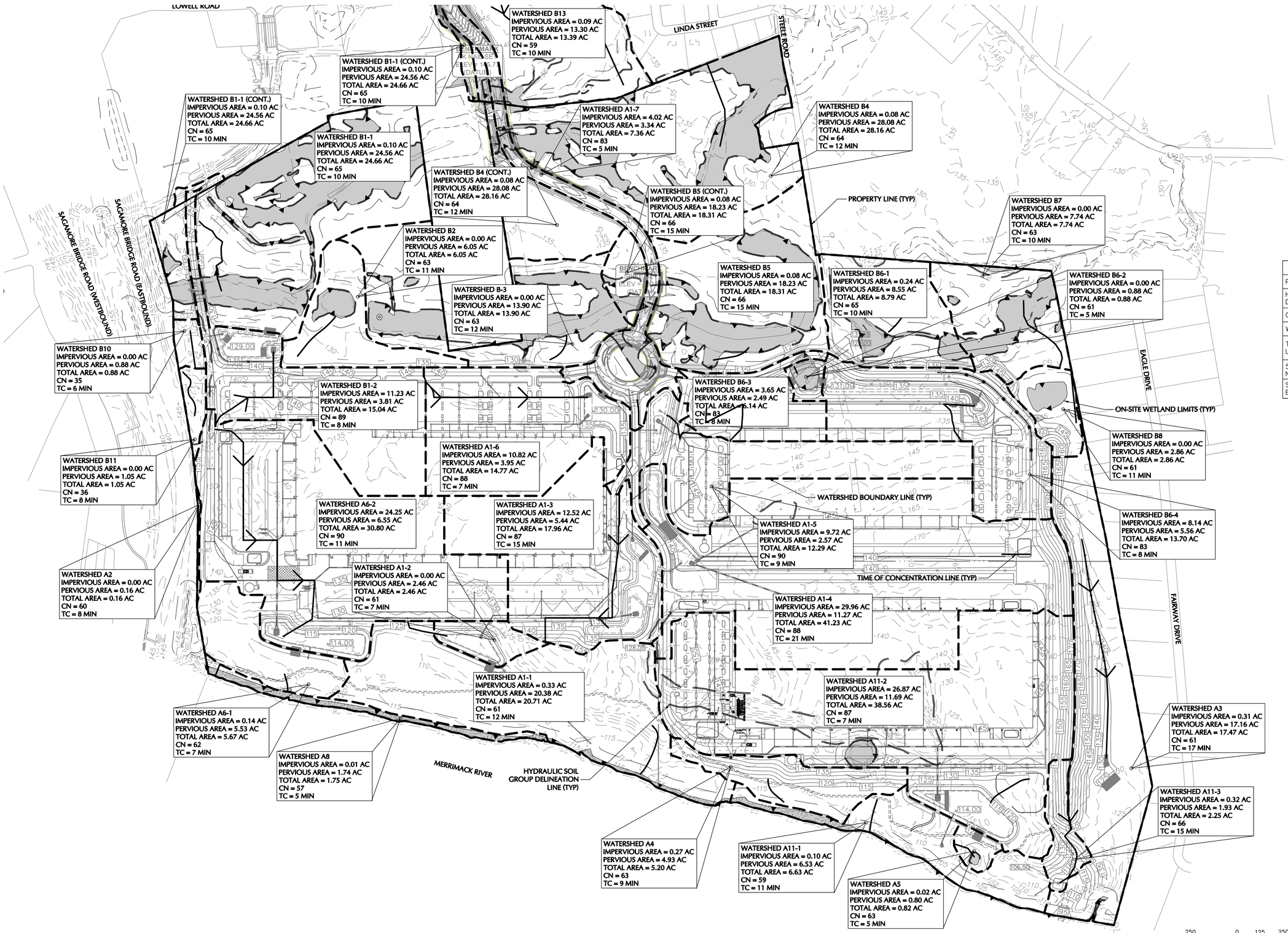
Drawing Title
SITE SPECIFIC SOIL MAP PLAN IV PROPOSED COLOR

Project No.	Drawing No.
151010101	SSSM104 PR
Date: 05/22/2020	
Drawn By: RJS	
Checked By: NLK	Sheet 26 of 10

LANGAN Project No. 151010101

Date: 9/14/2020 Time: 13:24 User: creynolds Style Table: Langan.stb Layout: PRO COLOR SOIL MAP IV Document Code: 151010101-0203-CA101-0109

Proposed Watershed Map Plans



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PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
TIME OF CONCENTRATION LINE	
50' WETLAND ZONE OF NONINTERFERENCE	
SUB-WATERSHED BOUNDARY	

Date	Description	No.
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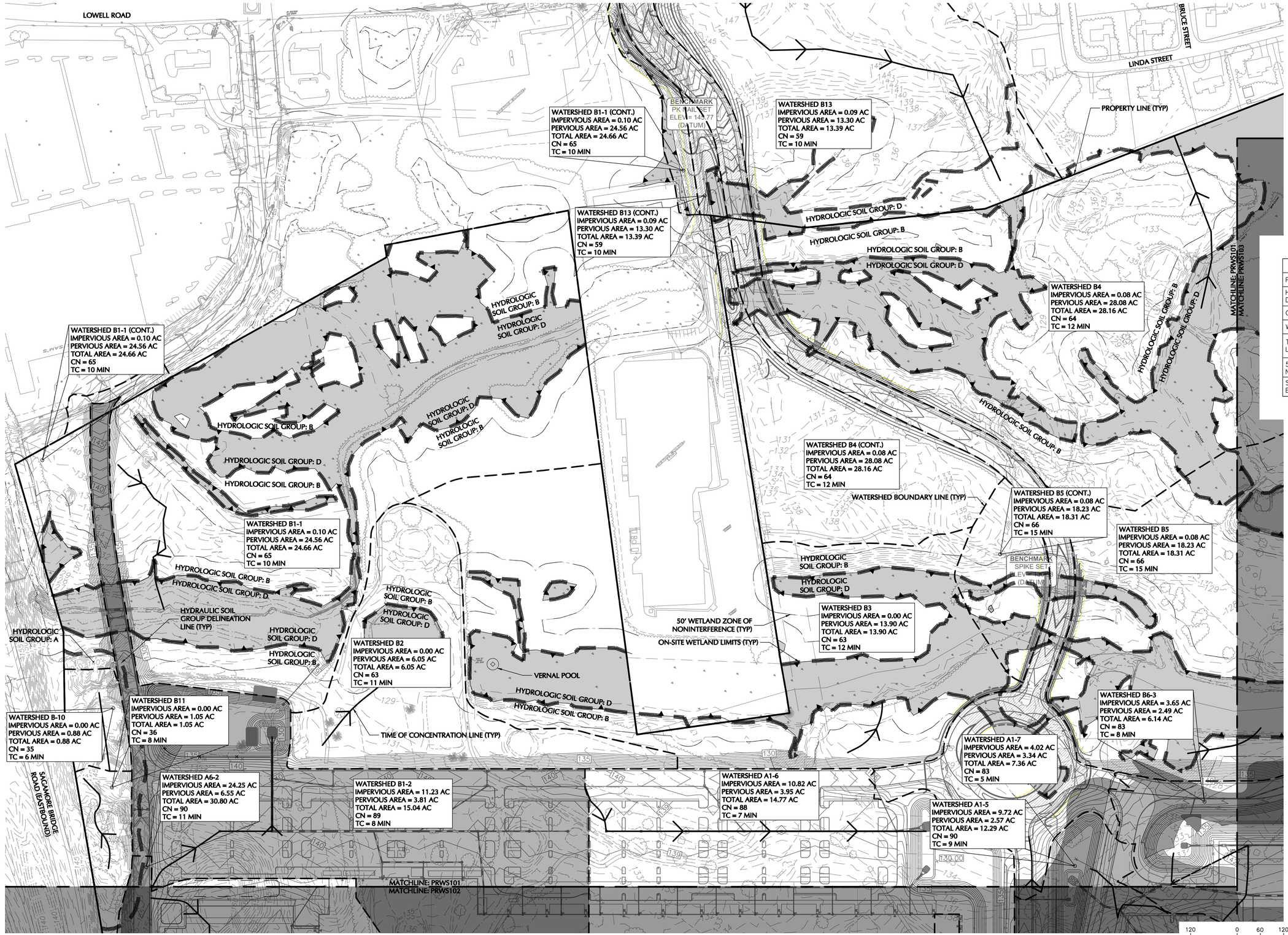
Drawing Title

PROPOSED WATERSHED MAP OVERALL PLAN

Project No. 151010101	Drawing No. PRWS100
Date 05/21/2020	
Drawn By RJS	
Checked By NLK	Sheet 10 of 10

LANGAN Project No. 151010101



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PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
TIME OF CONCENTRATION LINE	
50' WETLAND ZONE OF NONINTERFERENCE	
SUB-WATERSHED BOUNDARY	

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08/17/20	CONSERVATION COMMISSION REVISIONS	1

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Drawing Title

PROPOSED WATERSHED MAP PLAN I

Project No.	Drawing No.
151010101	PRWS101
Date: 05/21/2020	
Drawn By: RJS	
Checked By: NLK	Sheet 11 of 10

LANGAN Project No. 151010101

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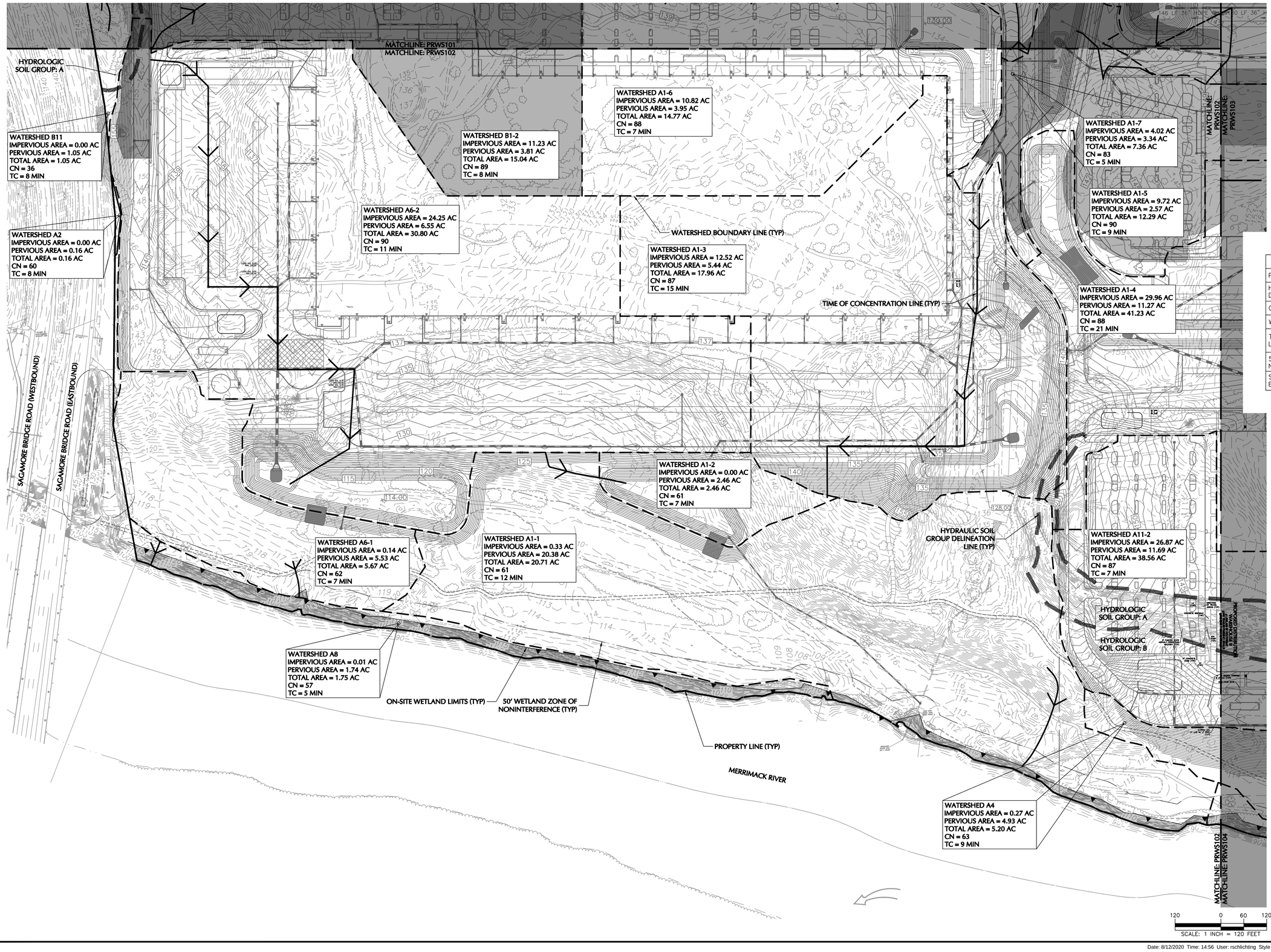

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PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
TIME OF CONCENTRATION LINE	
50' WETLAND ZONE OF NONINTERFERENCE	
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Drawing Title

PROPOSED WATERSHED MAP PLAN II

Project No.	Drawing No.
151010101	PRWS102
Date: 05/21/2020	
Drawn By: RJS	
Checked By: NLK	Sheet 12 of 10

LANGAN Project No. 151010101

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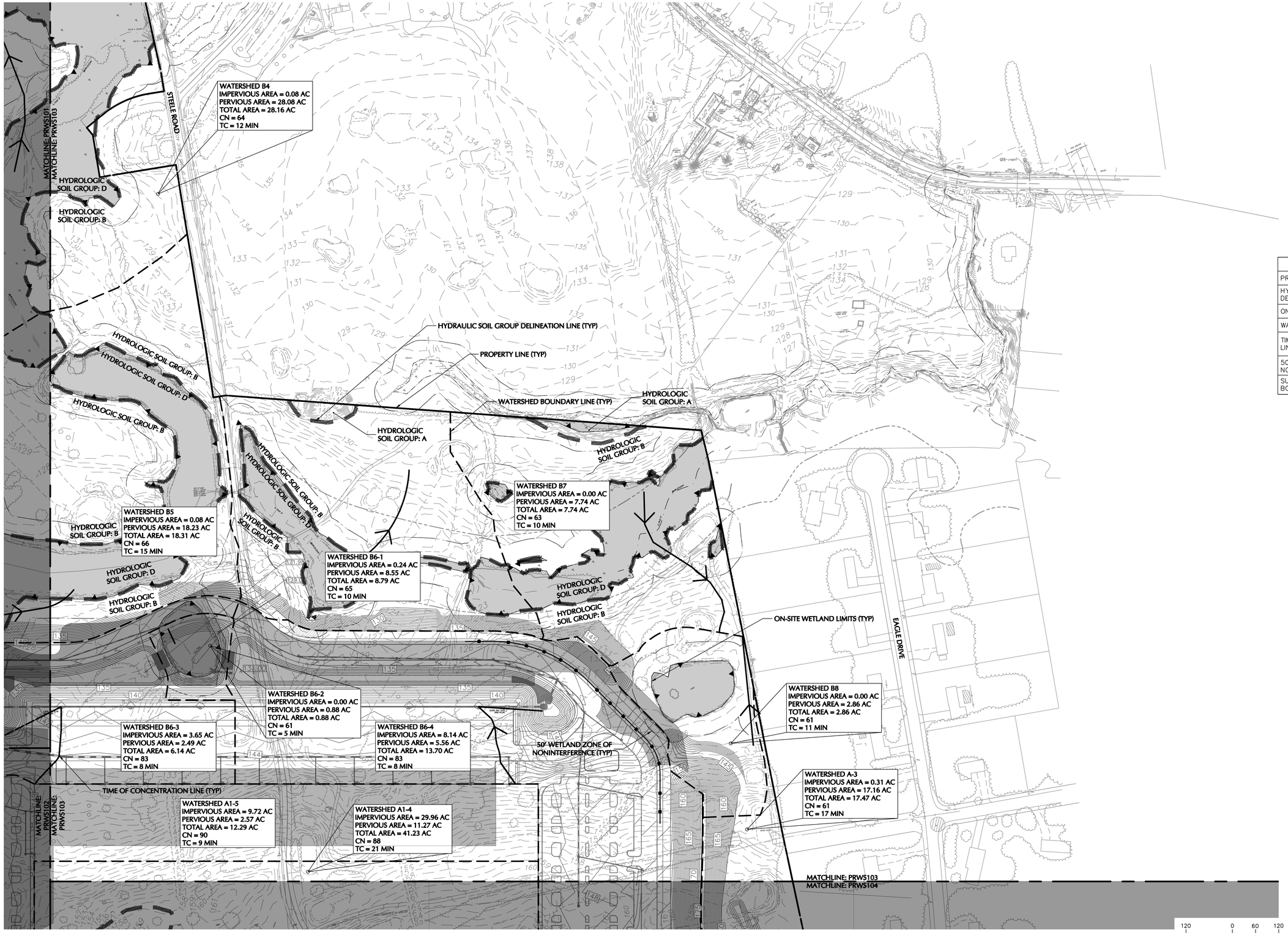

LEGEND	
PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
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WATERSHED BOUNDARY	
TIME OF CONCENTRATION LINE	
50' WETLAND ZONE OF NONINTERFERENCE	
SUB-WATERSHED BOUNDARY	

Date	Description	No.
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HUDSON NEW HAMPSHIRE

Drawing Title

PROPOSED WATERSHED MAP PLAN III

Project No. 151010101	Drawing No. PRWS103
Date 05/21/2020	
Drawn By RJS	
Checked By NLK	Sheet 13 of 10

LANGAN Project No. 151010101

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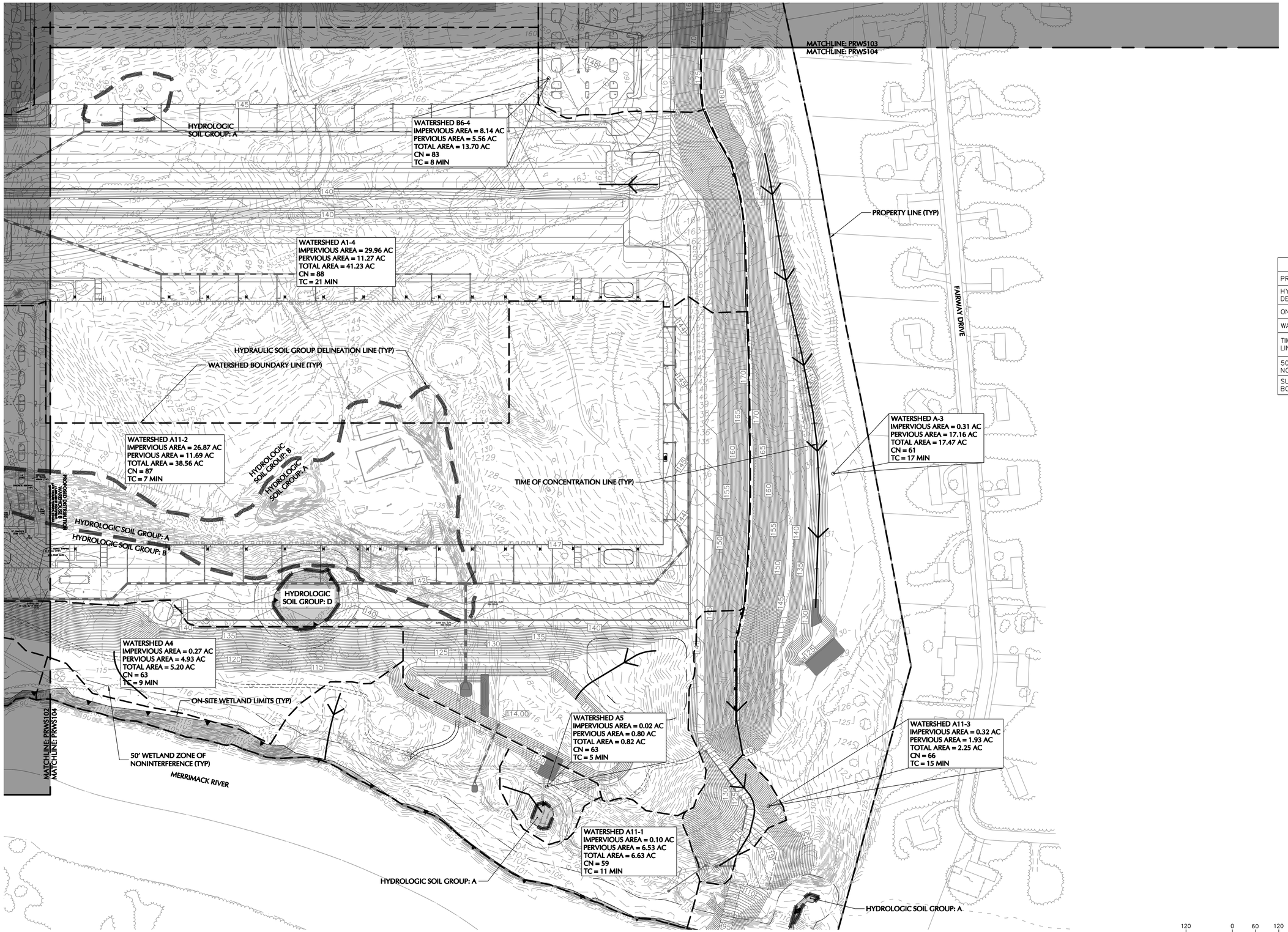

LEGEND	
PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
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TIME OF CONCENTRATION LINE	
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HUDSON LOGISTICS CENTER

HUDSON NEW HAMPSHIRE

Drawing Title

PROPOSED WATERSHED MAP PLAN IV

Project No. 151010101	Drawing No. PRWS104
Date 05/21/2020	
Drawn By RJS	
Checked By NLK	Sheet 14 of 10

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Project No. 151010101

Date: 8/12/2020 Time: 15:00 User: rschlichting Style Table: Langan.stb Layout: PRWS 104 Document Code: 151010101-0203-CG104-0105

LOWELL ROAD

BRUCE STREET

LINDA STREET

SAGAMORE BRIDGE ROAD (EASTBOUND)

EXISTING SAW'S CLUB

HYDROLOGIC SOIL GROUP: B

HYDROLOGIC SOIL GROUP: D

50' WETLAND ZONE OF NONINTERFERENCE (TYP)

PROPERTY LINE (TYP)

ON-SITE WETLAND LIMITS (TYP)

HYDRAULIC SOIL GROUP DELINEATION LINE (TYP)

VERNAL POOL

DRAINAGE AREA DELINEATION LINE (TYP)

MATCHLINE: DACB101
MATCHLINE: DACB102

CCB-16 (B1-2)
CCB-15 (B1-2)
CCB-14 (B1-2)
CCB-17 (B1-2)
CCB-13 (B1-2)
CCB-12 (B1-2)
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CCB-9 (A1-6)
CCB-2 (B6-2)
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CCB-3 (B6-2)
CCB-1 (A1-5)
CCB-2 (A1-5)
CLCB-3 (B1-2)
CLCB-5 (B1-2)
DOUBLE CLCB-6 (B1-2)
CLCB-7 (B1-2)
CLCB-6 (A1-6)
CLCB-5 (A1-6)
CLCB-4 (A1-6)
CLCB-10 (B1-2)
CLCB-1 (B1-2)
CLCB-2 (B1-2)
CLCB-4 (B1-2)
CLCB-3 (A1-6)
CLCB-2 (A1-6)
DOUBLE CCB-1 (A1-6)

120 0 60 120
SCALE: 1 INCH = 120 FEET

LEGEND

PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
50' WETLAND ZONE OF NONINTERFERENCE	
DRAINAGE AREA DELINEATION LINE	

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Project

HUDSON LOGISTICS CENTER

HUDSON NEW HAMPSHIRE

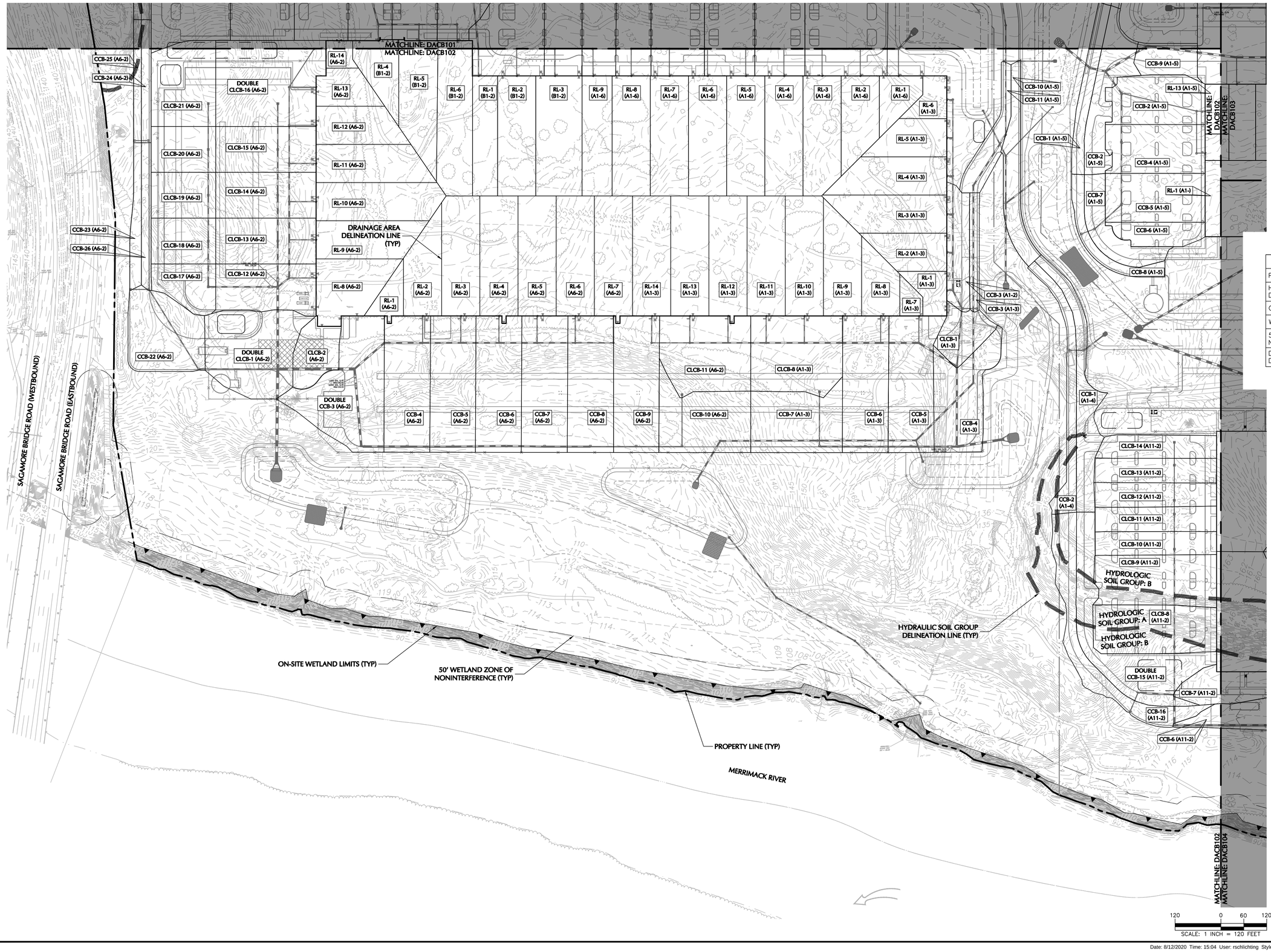
Drawing Title

DRAINAGE AREA MAP I

Project No. 151010101	Drawing No. DACB101
Date 05/21/2020	
Drawn By CDR	
Checked By NLK	Sheet 15 of 10

LANGAN Project No. 151010101

Date: 8/12/2020 Time: 15:02 User: rschlichting Style Table: Langan.stb Layout: DACB 101 Document Code: 151010101-0203-CB104-0101



LEGEND	
PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
50' WETLAND ZONE OF NONINTERFERENCE	
DRAINAGE AREA DELINEATION LINE	

Date	Description	No.
08/17/20	CONSERVATION COMMISSION REVISIONS	1

Revisions

Signature Date

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Project

HUDSON LOGISTICS CENTER

HUDSON NEW HAMPSHIRE

Drawing Title

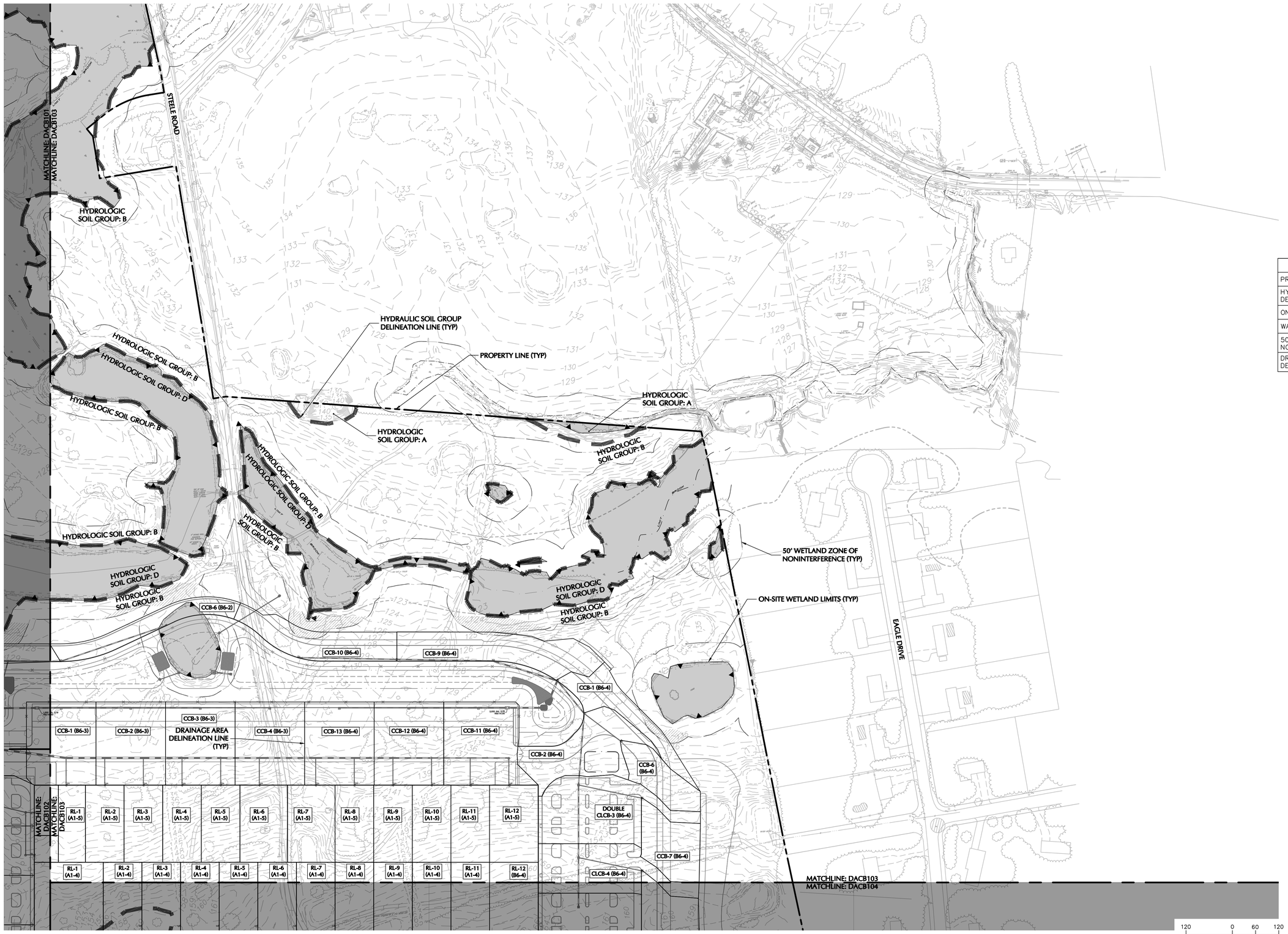
DRAINAGE AREA MAP II

Project No.	Drawing No.
151010101	DACB102
Date: 05/21/2020	
Drawn By: CDR	
Checked By: NLK	Sheet 16 of 10

LANGAN

Project No. 151010101

Date: 8/12/2020 Time: 15:04 User: rschlichting Style Table: Langan.stb Layout: DACB102 Document Code: 151010101-0502-CG104-0101



LEGEND	
PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
50' WETLAND ZONE OF NONINTERFERENCE	
DRAINAGE AREA DELINEATION LINE	

Date	Description	No.
08/17/20	CONSERVATION COMMISSION REVISIONS	1

Revisions

Signature Date

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Project

HUDSON LOGISTICS CENTER

HUDSON NEW HAMPSHIRE

Drawing Title

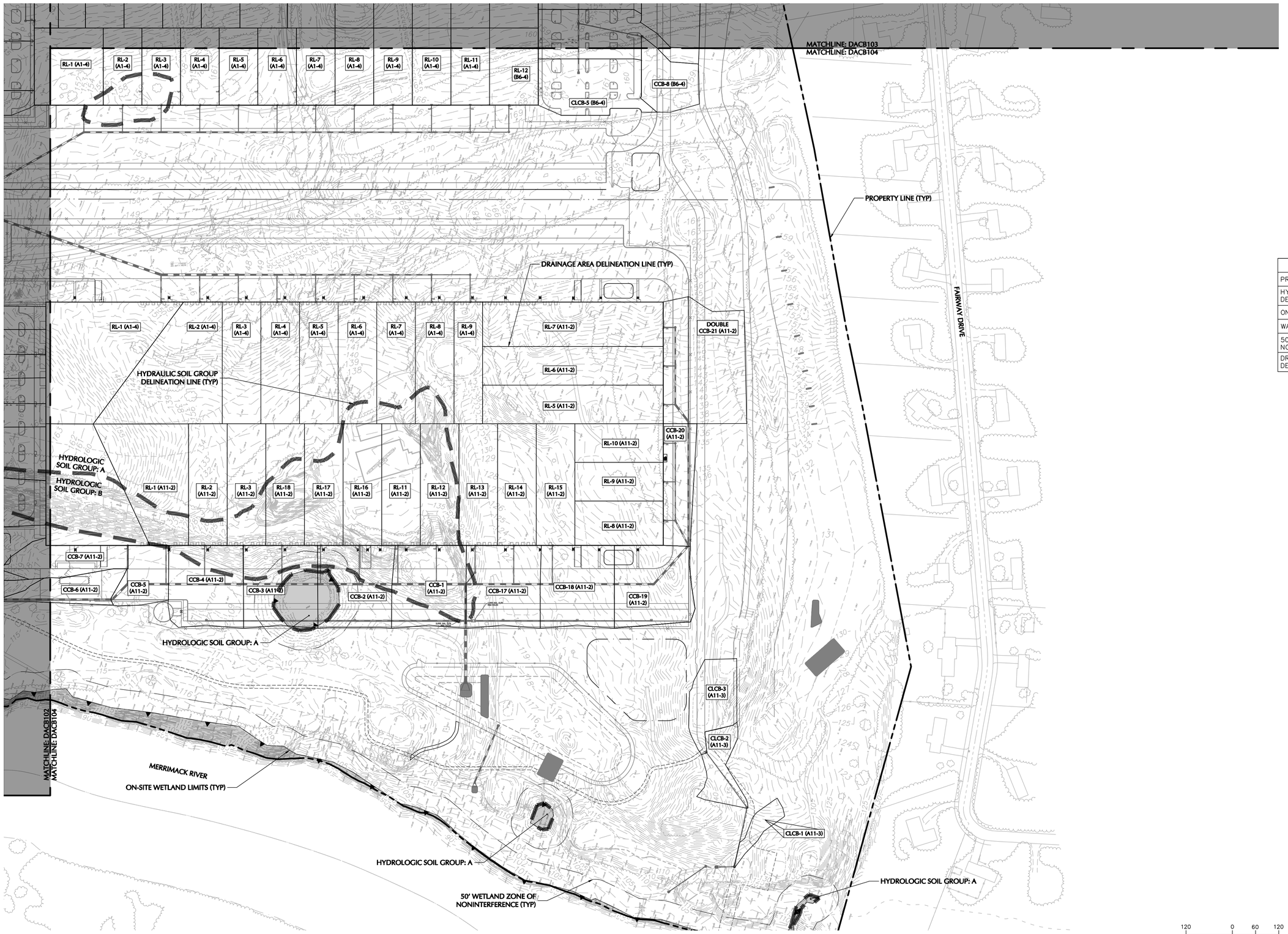
DRAINAGE AREA MAP III

Project No.	Drawing No.
151010101	DACB103
Date: 05/21/2020	
Drawn By: CDR	
Checked By: NLK	Sheet 17 of 10

LANGAN

Project No. 151010101

Date: 8/12/2020 Time: 15:05 User: rschlichting Style Table: Langan.stb Layout: DA103 Document Code: 151010101-0203-CG104-0106



LEGEND	
PROPERTY LINE	
HYDROLOGIC SOIL GROUP DELINEATION LINE	
ON-SITE WETLAND LIMITS	
WATERSHED BOUNDARY	
50' WETLAND ZONE OF NONINTERFERENCE	
DRAINAGE AREA DELINEATION LINE	

120 0 60 120
SCALE: 1 INCH = 120 FEET

Date	Description	No.
08/17/20	CONSERVATION COMMISSION REVISIONS	1

Revisions

Signature Date

LANGAN

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Project

HUDSON LOGISTICS CENTER

HUDSON NEW HAMPSHIRE

Drawing Title

DRAINAGE AREA MAP IV

Project No.	Drawing No.
151010101	DACB104
Date: 05/21/2020	
Drawn By: CDR	
Checked By: NLK	Sheet 18 of 10

LANGAN Project No. 151010101

Date: 8/12/2020 Time: 15:06 User: rschlichting Style Table: Langan.stb Layout: DACB104 Document Code: 151010101-0203-CG104-0107

APPENDICES

APPENDIX G

Groundwater Recharge Volume Calculations

Groundwater Recharge Volume (GRV) Calculation

7.72	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
129.18	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
6.37	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = weighted groundwater recharge depth	
35.383	ac-in	GRV = AI * Rd	
128,543	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Water Quality Volume & Groundwater Recharge Compliance (CF)

	WQv	In Excess of Required
Required	501,270	
90% TSS Provided	788,543	287,273
80% TSS Provided	30,000	30,000
TBD% TSS Dry Ext. Det.	29,828	29,828

	GRv	
Required	128,440	
Total Provided	788,543	660,103

BMP Sizing Summary Chart (CF Unless otherwise noted)

Stormwater Feature	TSS Removal	Watershed	WQv (Required)	WQv (Provided)	Pre-treatment (Required)	Pre-treatment (Provided)	GRv (Provided)
Infiltration Basin	90%	A1-2	446	43,200	112	N/A	43,200
Infiltration Basin	90%	A1-3	44,163	56,919	4,416	23,400	56,919
Infiltration Basin	90%	A1-4	105,363	106,654	26,341	29,700	106,654
Infiltration Basin	90%	A1-5	33,986	50,888	8,497	9,390	50,888
Infiltration Basin	90%	A1-6	38,030	104,304	9,508	14,000	104,304
Hydrodynamic Unit	80%	A1-7	4.697 CFS	8.82 CFS	-	-	-
			or	or			
			16,533	30,000			-
Infiltration Basin	90%	A6-2	84,815	95,837	21,204	22,650	95,837
Infiltration Basin	90%	A11-2	94,783	135,495	23,696	26,320	135,495
Infiltration Basin	90%	A11-3	1,454	12,205	364	886	12,205
Infiltration Basin	90%	B1-2	39,418	94,982	9,855	13,380	94,982
Sediment Forebay	TBD	B1-2A	-	-	1,381	3,480	-
Sediment Forebay	TBD	B1-2B	-	-	8,842	9,900	-
Dry Ext. Det. Pond w/ Micro Pool	TBD	B6-2	160	29,828	40	N/A	29,828
Infiltration Basin	90%	B6-3	13,039	26,986	3,260	7,400	26,986
Infiltration Basin	90%	B6-4	29,080	61,073	7,270	7,740	61,073

APPENDIX H

BMP Worksheets

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration Basin A1-2**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
2.46	ac	A = Area draining to the practice	
-	ac	A_I = Impervious area draining to the practice	
-	decimal	I = percent impervious area draining to the practice, in decimal form	
0.05	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
446	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
112	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
43,200	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
18,600	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
0.0	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
114.00	feet	E_{BTM} = elevation of the bottom of the basin	
111.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
111.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
3.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
115.53	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
116.51	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
120.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: This feature is a second stage for previously treated stormwater.
Therefore, a sediment forebay is not required.

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 1 - A1-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 114.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	114.00	18,600	0	0
1.00	115.00	21,600	20,079	20,079
2.00	116.00	24,700	23,130	43,210
3.00	117.00	27,900	26,281	69,491
4.00	118.00	31,200	29,532	99,022
5.00	119.00	34,600	32,882	131,905
6.00	120.00	38,100	36,332	168,237

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	6.00	0.00	0.00
Span (in)	= 24.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 113.00	116.00	0.00	0.00
Length (ft)	= 620.00	0.50	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .011	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

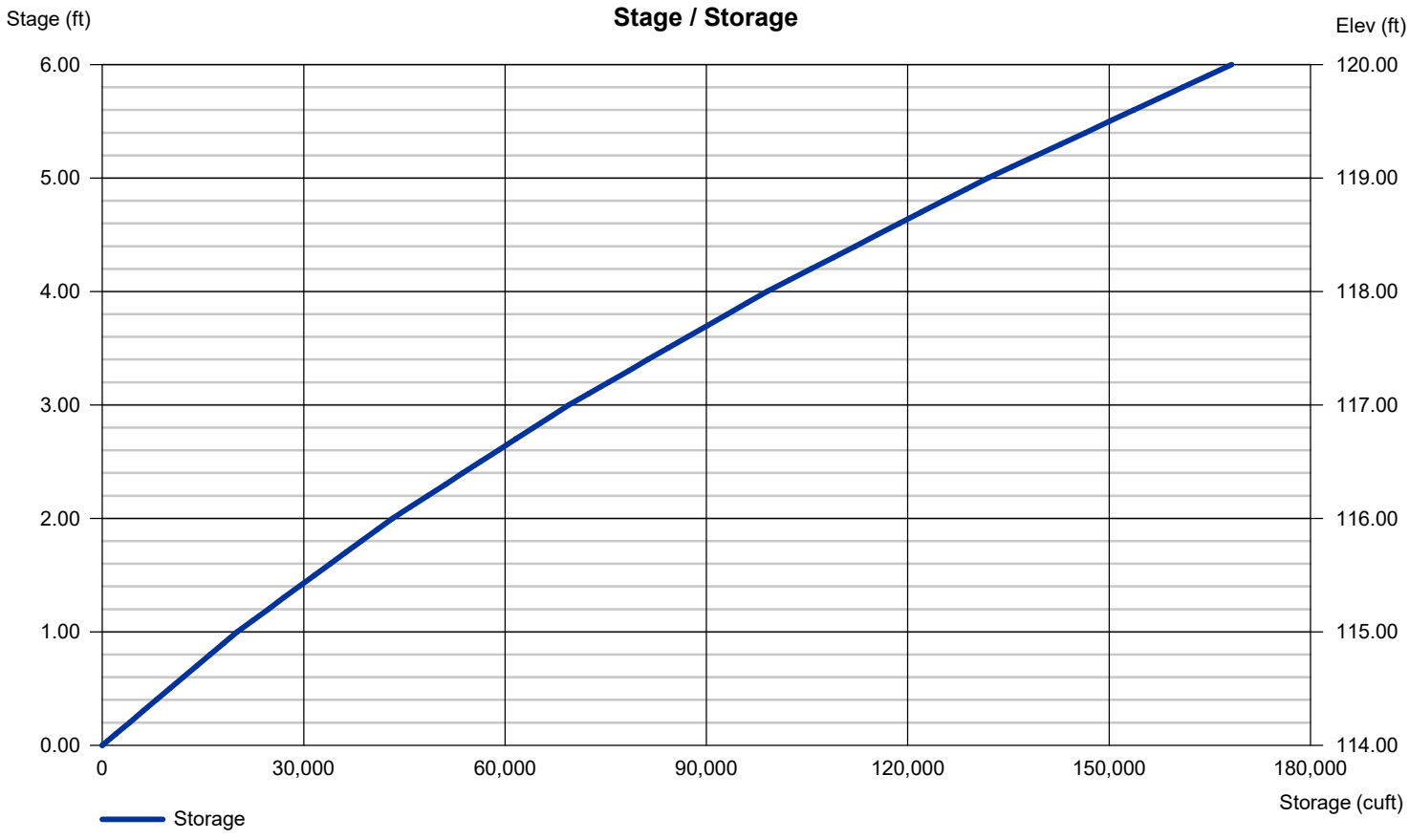
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	30.00	0.00
Crest El. (ft)	= 118.00	116.00	119.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A1-3 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
17.96	ac	A = Area draining to the practice	
12.52	ac	A_I = Impervious area draining to the practice	
0.70	decimal	I = percent impervious area draining to the practice, in decimal form	
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
12.17	ac-in	WQV= 1" x Rv x A	
44,163	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
11,041	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
23,400	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
56,919	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
20,333	sf	A_{SA} = surface area of the bottom of the pond	
50.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
0.5	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
128.00	feet	E_{BTM} = elevation of the bottom of the basin	
123.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
115.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
5.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
13.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
128.86	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
130.25	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
134.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 2 - A1-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 128.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	128.00	23,000	0	0
2.00	130.00	34,300	56,919	56,919
3.00	131.00	57,400	45,353	102,272
4.00	132.00	64,000	60,664	162,936
5.00	133.00	70,700	67,316	230,251
6.00	134.00	77,400	74,017	304,269

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	Inactive	0.00	0.00
Span (in)	= 24.00	12.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 128.00	127.00	0.00	0.00
Length (ft)	= 50.00	0.50	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

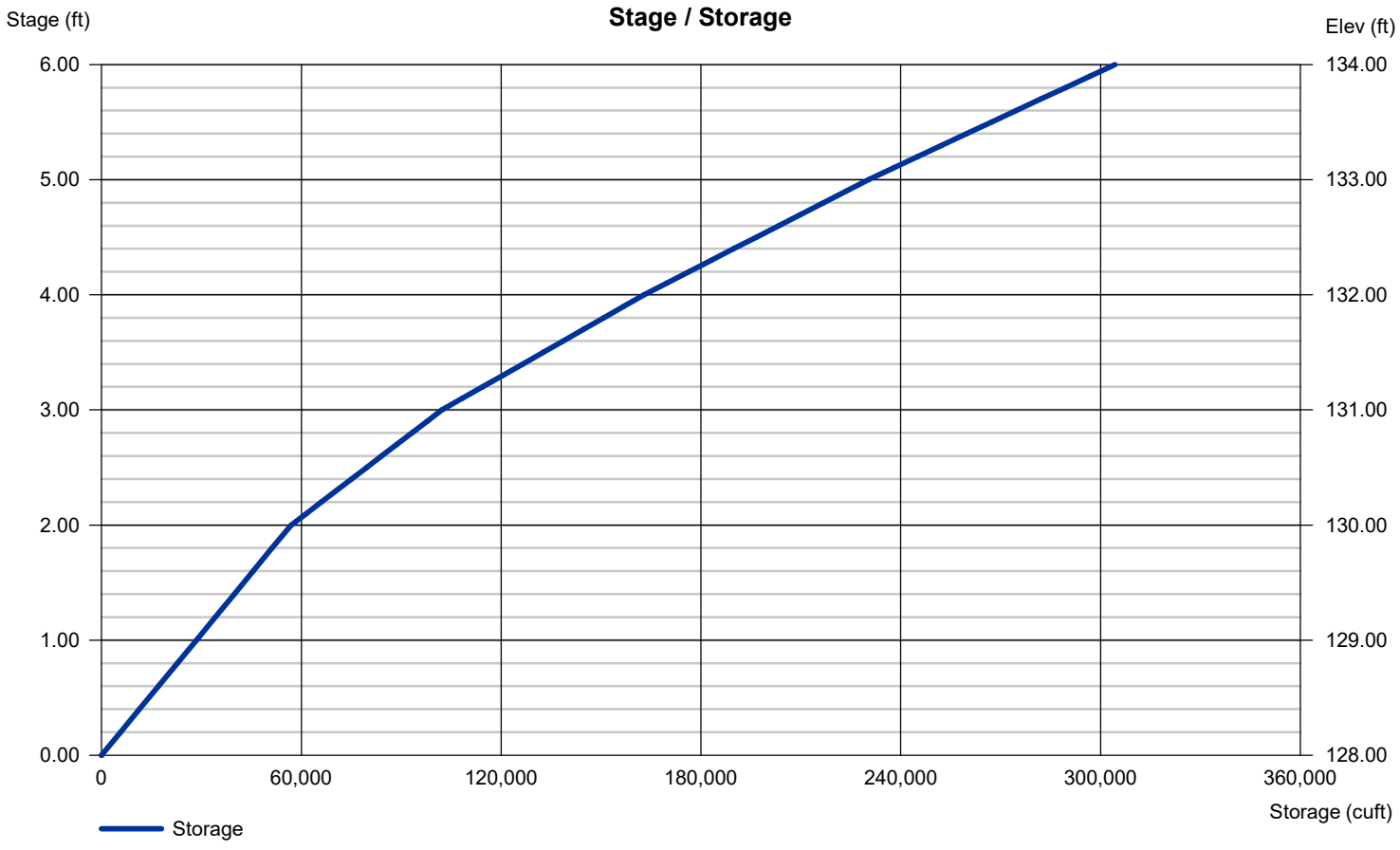
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.50	10.00	0.00
Crest El. (ft)	= 132.00	130.00	133.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 50.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration Basin A1-4**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
41.23	ac	A = Area draining to the practice	
29.96	ac	A_I = Impervious area draining to the practice	
0.73	decimal	I = percent impervious area draining to the practice, in decimal form	
0.70	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
29.03	ac-in	WQV= 1" x Rv x A	
105,363	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
26,341	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
29,700	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
106,654	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
11,095	sf	A_{SA} = surface area of the bottom of the pond	
50.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
2.3	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
133.00	feet	E_{BTM} = elevation of the bottom of the basin	
129.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
123.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
4.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
10.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
135.61	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
136.17	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
139.25	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 — Wednesday, 08 / 12 / 2020

Pond No. 3 - A1-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 133.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	133.00	13,000	0	0
0.75	133.75	11,410	9,146	9,146
1.25	134.25	21,079	7,999	17,145
2.00	135.00	44,820	24,157	41,302
2.50	135.50	64,766	27,241	68,543
3.00	136.00	88,300	38,111	106,654
3.50	136.50	115,521	50,798	157,452
4.00	137.00	146,577	65,364	222,816
4.50	137.50	181,650	81,892	304,708
5.00	138.00	220,918	100,472	405,180
5.50	138.50	264,559	121,193	526,374
6.00	139.00	312,067	143,979	670,352
6.25	139.25	337,093	81,117	751,469

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	Inactive	0.00	0.00
Span (in)	= 30.00	10.00	0.00	0.00
No. Barrels	= 1	4	0	0
Invert El. (ft)	= 132.00	135.50	0.00	0.00
Length (ft)	= 144.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

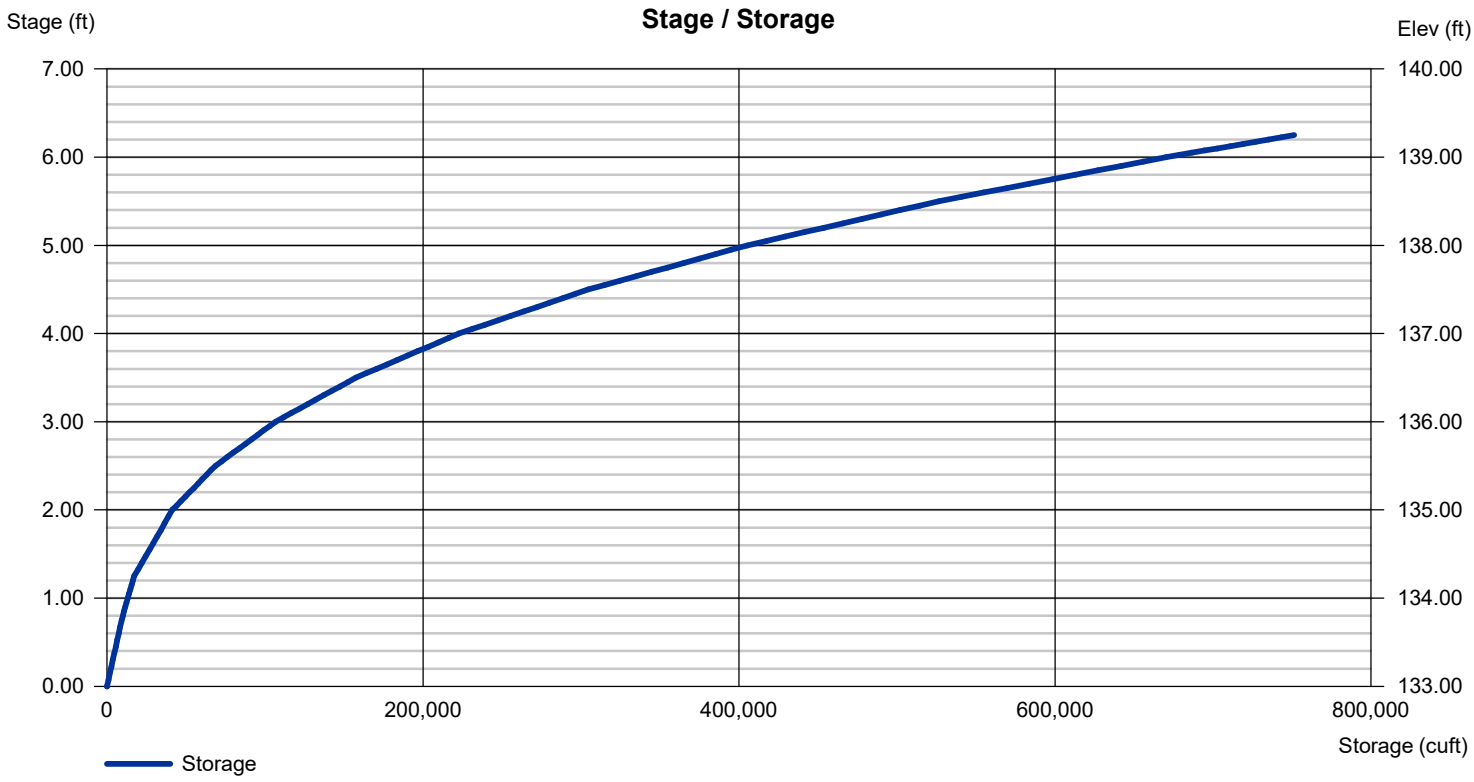
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.50	0.00	0.00
Crest El. (ft)	= 137.50	136.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 50.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A1-5 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
12.29	ac	A = Area draining to the practice	
9.72	ac	A_I = Impervious area draining to the practice	
0.79	decimal	I = percent impervious area draining to the practice, in decimal form	
0.76	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
9.36	ac-in	WQV= 1" x Rv x A	
33,986	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
8,496	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
9,390	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
50,888	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
8,100	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
5.0	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
131.00	feet	E_{BTM} = elevation of the bottom of the basin	
125.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
115.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
6.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
16.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
135.10	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
136.56	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
138.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 4 - A1-5

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 131.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	131.00	12,900	0	0
1.00	132.00	15,600	14,227	14,227
2.00	133.00	18,300	16,930	31,158
3.00	134.00	21,200	19,730	50,888
4.00	135.00	24,200	22,681	73,569
5.00	136.00	27,300	25,732	99,301
6.00	137.00	30,400	28,833	128,134
7.00	138.00	33,700	32,033	160,167

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 130.00	134.00	0.00	0.00
Length (ft)	= 500.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .012	.012	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

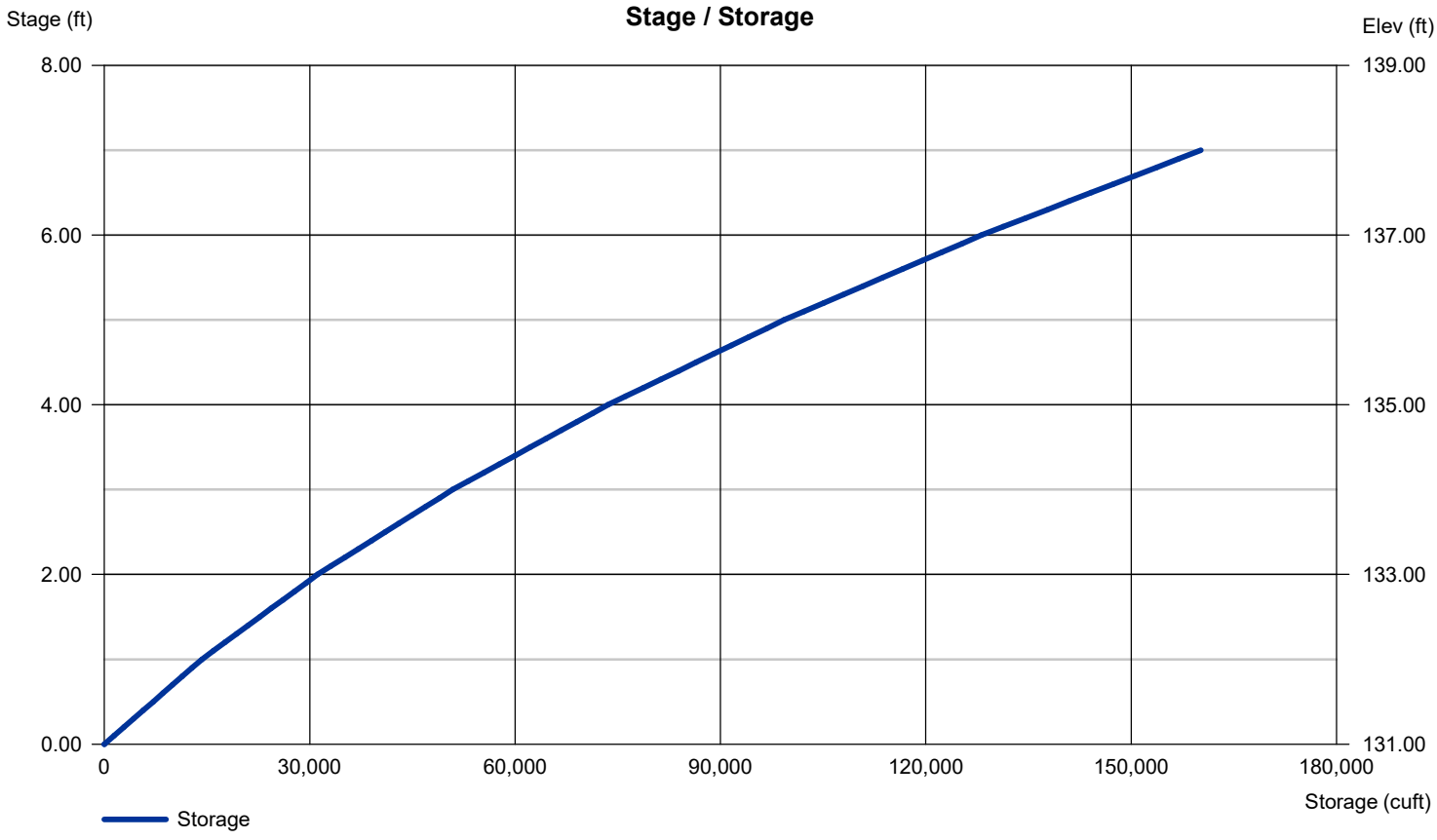
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	30.00	0.00
Crest El. (ft)	= 136.50	136.00	137.00	0.00
Weir Coeff.	= 3.33	4.40	2.60	3.33
Weir Type	= 1	120 degV	Broad	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A1-6 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
14.77	ac	A = Area draining to the practice	
10.82	ac	A_I = Impervious area draining to the practice	
0.73	decimal	I = percent impervious area draining to the practice, in decimal form	
0.71	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
10.48	ac-in	WQV= 1" x Rv x A	
38,030	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
9,507	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
14,000	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
104,304	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
20,200	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
2.3	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
130.00	feet	E_{BTM} = elevation of the bottom of the basin	
126.70	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
115.50	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.30	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
14.5	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
132.22	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
133.33	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
135.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 — Wednesday, 08 / 12 / 2020

Pond No. 5 - A1-6

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 130.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	130.00	28,750	0	0
1.00	131.00	32,700	30,701	30,701
2.00	132.00	36,800	34,726	65,427
3.00	133.00	41,000	38,877	104,304
4.00	134.00	45,300	43,128	147,432
5.00	135.00	49,700	47,478	194,910

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 129.00	133.00	0.00	0.00
Length (ft)	= 450.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.50	30.00	0.00
Crest El. (ft)	= 133.50	133.00	134.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

General Calculations - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

7.36	ac	A = Area draining to the practice
4.02	ac	A_I = Impervious area draining to the practice
0.55	decimal	I = percent impervious area draining to the practice, in decimal form
0.54	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
3.99	ac-in	WQV= 1" x Rv x A
14,469	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = amount of rainfall. For WQF in NH, P = 1".
0.54	inches	Q = water quality depth. Q = WQV/A
95	unitless	CN = unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.6	inches	S = potential maximum retention. S = (1000/CN) - 10
0.113	inches	Ia = initial abstraction. Ia = 0.2S
10.0	minutes	T_c = Time of Concentration
660.0	$cfs/mi^2/in$	qu is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III
4.111	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$

Designer's Notes: Watershed A1-7

An 8 ft model, down stream defender hydrodynamic unit will be used to treat the water quality volume from this watershed.
The units is rated for 80% TSS removeal of OK-110 partical size for flows up to 8.82cfs
Product details are attached.

While this unit will treat 80% TSS removal, treated flows are discharged to Infiltration Basin A1-2, providing additional treatment at 90% TSS removal.

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A6-2 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
30.80	ac	A = Area draining to the practice	
24.25	ac	A_I = Impervious area draining to the practice	
0.79	decimal	I = percent impervious area draining to the practice, in decimal form	
0.76	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
23.37	ac-in	WQV= 1" x Rv x A	
84,815	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
21,204	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
22,650	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
95,837	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
33,000	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
3.1	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
114.00	feet	E_{BTM} = elevation of the bottom of the basin	
103.50	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
130.50	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
10.50	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
(16.5)	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soil		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
117.37	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
118.38	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
120.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 — Wednesday, 08 / 12 / 2020

Pond No. 8 - A6-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 114.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	114.00	42,900	0	0
1.00	115.00	47,900	45,373	45,373
1.50	115.50	50,500	24,595	69,967
2.00	116.00	53,000	25,870	95,837
3.00	117.00	58,200	55,574	151,411
4.00	118.00	63,600	60,874	212,285
5.00	119.00	69,000	66,275	278,560
6.00	120.00	74,500	71,725	350,286

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	6.00	0.00	0.00
Span (in)	= 24.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 113.50	116.00	0.00	0.00
Length (ft)	= 50.00	0.50	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

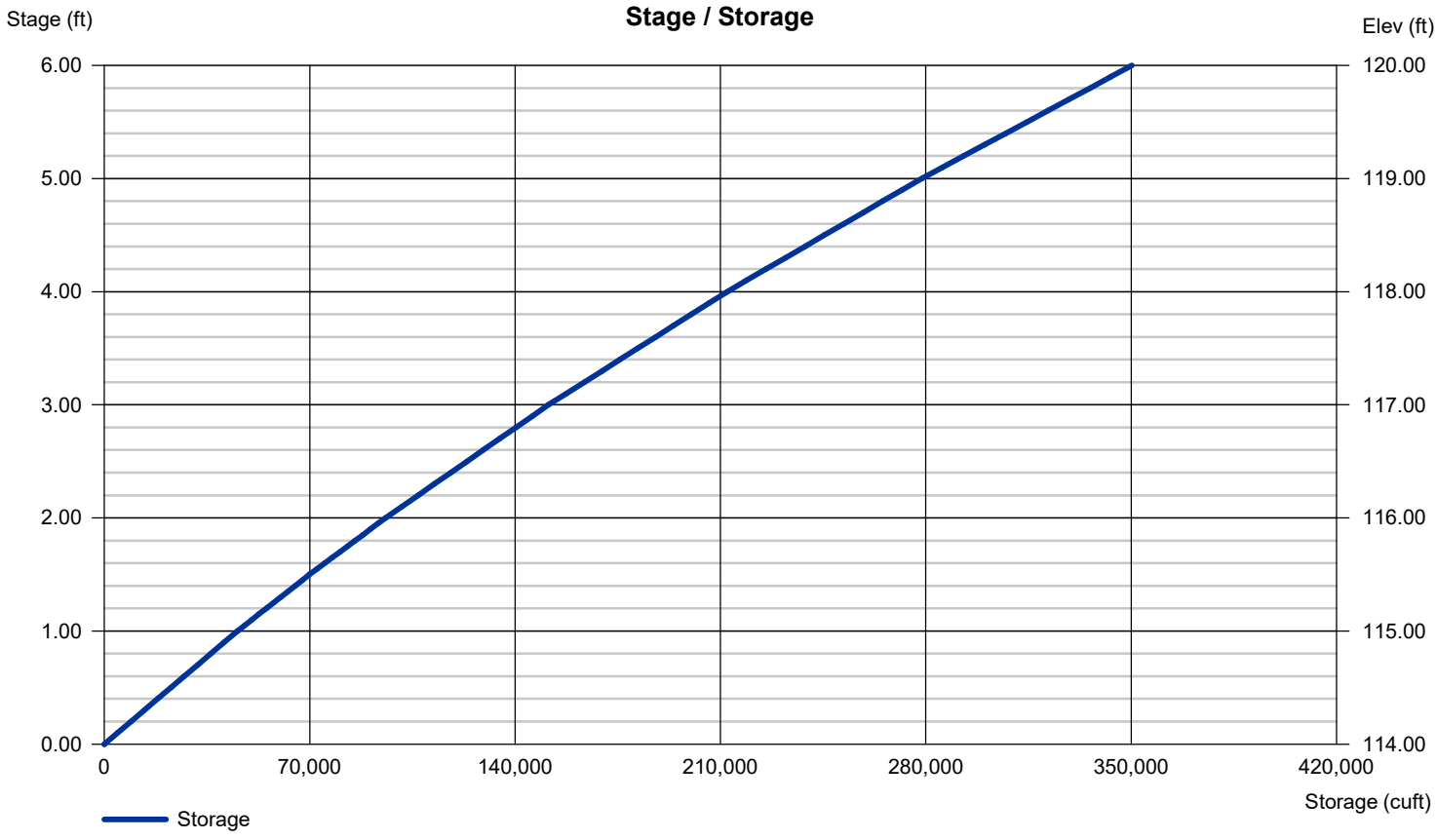
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 117.00	119.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A11-2 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
38.56	ac	A = Area draining to the practice	
26.87	ac	A_I = Impervious area draining to the practice	
0.70	decimal	I = percent impervious area draining to the practice, in decimal form	
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
26.11	ac-in	WQV= 1" x Rv x A	
94,783	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
23,696	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
26,320	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
135,495	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
44,200	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
2.6	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
114.00	feet	E_{BTM} = elevation of the bottom of the basin	
105.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
105.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
9.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
9.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
116.91	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
118.36	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
120.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 10 - A11-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 114.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	114.00	71,300	0	0
1.00	115.00	64,900	68,068	68,068
2.00	116.00	70,000	67,427	135,495
3.00	117.00	75,300	72,627	208,122
4.00	118.00	80,600	77,927	286,049
5.00	119.00	86,100	83,327	369,376
6.00	120.00	91,600	88,827	458,203

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	Inactive	0.00	0.00
Span (in)	= 36.00	12.00	0.00	0.00
No. Barrels	= 1	3	0	0
Invert El. (ft)	= 113.00	116.50	0.00	0.00
Length (ft)	= 159.00	0.50	0.00	0.00
Slope (%)	= 3.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

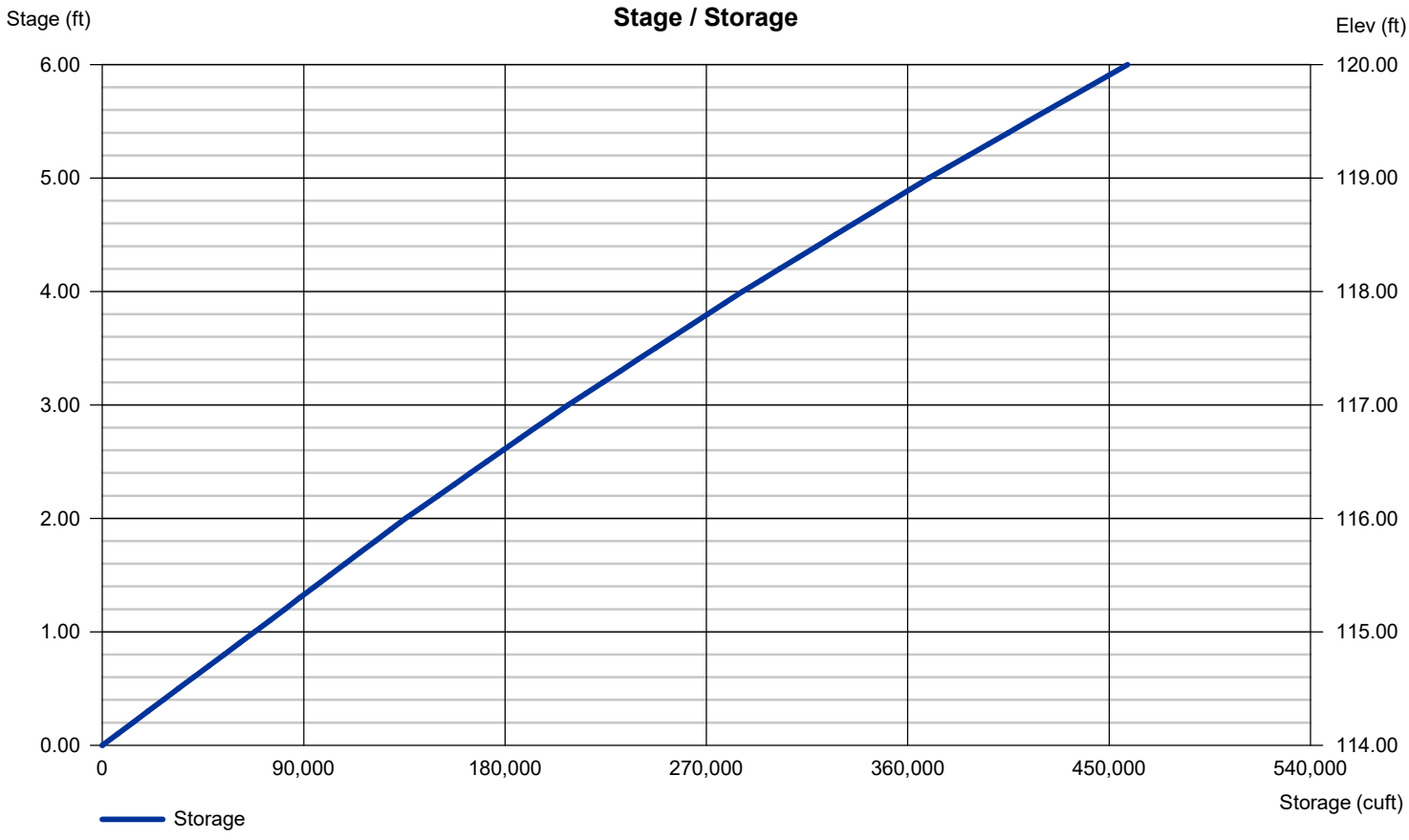
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.50	30.00	0.00
Crest El. (ft)	= 118.50	116.00	119.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **A11-3 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
2.25	ac	A = Area draining to the practice	
0.32	ac	A_I = Impervious area draining to the practice	
0.14	decimal	I = percent impervious area draining to the practice, in decimal form	
0.18	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.40	ac-in	WQV= 1" x Rv x A	
1,454	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
363	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
886	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
12,205	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
1,100	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
1.6	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
108.00	feet	E_{BTM} = elevation of the bottom of the basin	
94.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
84.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
14.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
24.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
109.35	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
109.60	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
112.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 11 - A11-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 108.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	108.00	1,100	0	0
4.00	112.00	4,100	9,764	9,764

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 107.00	0.00	0.00	0.00
Length (ft)	= 110.00	0.00	0.00	0.00
Slope (%)	= 1.36	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

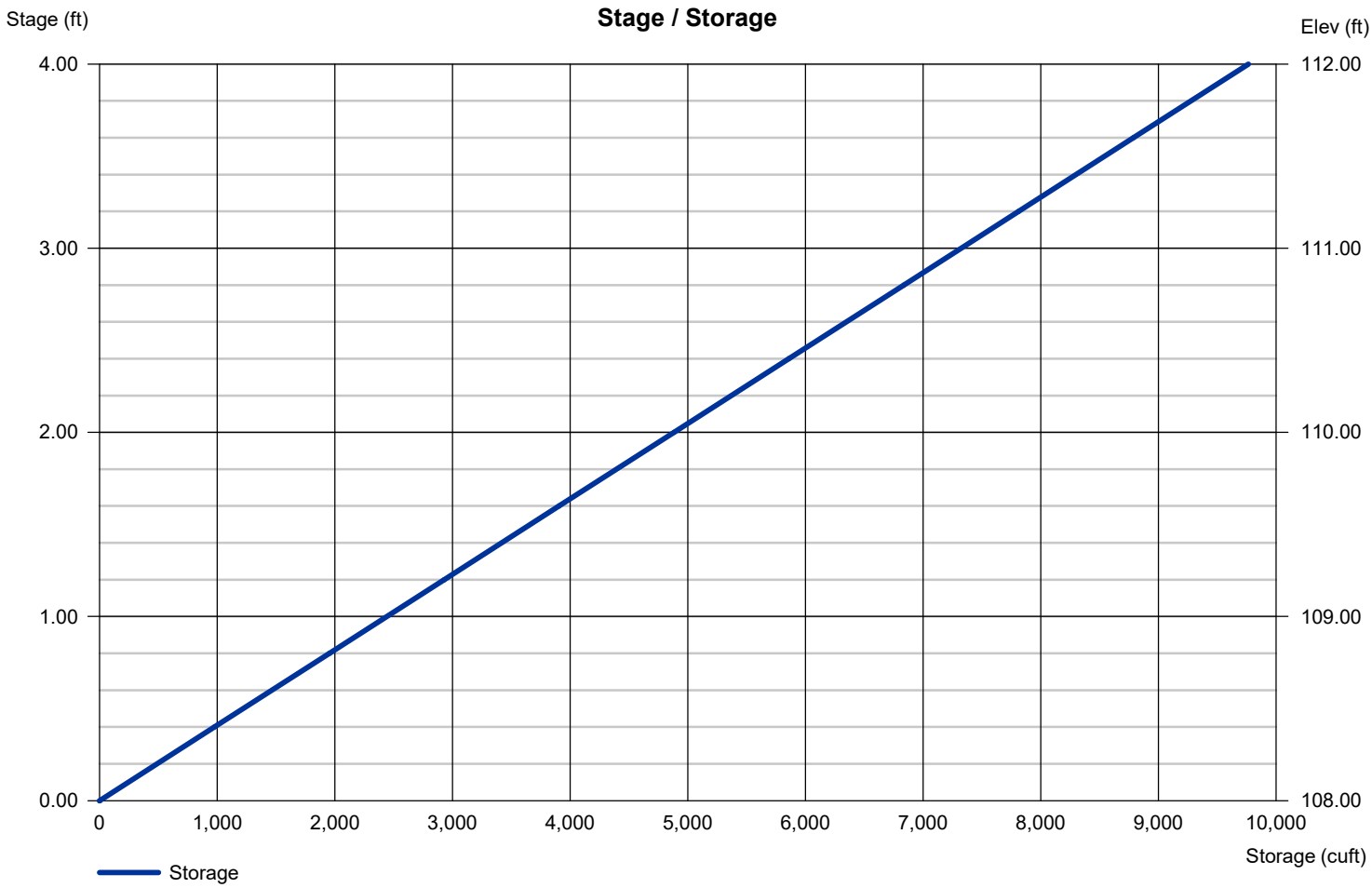
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	0.00	0.00
Crest El. (ft)	= 109.25	112.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 10.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **B1-2 Infiltration Basin**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
15.04	ac	A = Area draining to the practice	
11.23	ac	A_I = Impervious area draining to the practice	
0.75	decimal	I = percent impervious area draining to the practice, in decimal form	
0.72	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
10.86	ac-in	WQV= 1" x Rv x A	
39,418	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
9,855	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
13,380	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
94,982	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
23,219	sf	A_{SA} = surface area of the bottom of the pond	
10.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
2.0	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
129.00	feet	E_{BTM} = elevation of the bottom of the basin	
126.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
125.50	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
3.5	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
131.57	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
132.62	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
135.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Two Sediment Forebays are included in this pond.

Each forebay sub-watershed's WQV was calculated and the forebay sized to a capacity greater than 25%

The number above reflect the combine forebay volume.

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 13 - B1-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 129.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	129.00	23,219	0	0
1.00	130.00	26,154	24,669	24,669
2.00	131.00	36,456	31,160	55,829
3.00	132.00	41,922	39,153	94,982
4.00	133.00	47,300	44,580	139,562
5.00	134.00	51,019	49,143	188,705
6.00	135.00	54,834	52,910	241,615

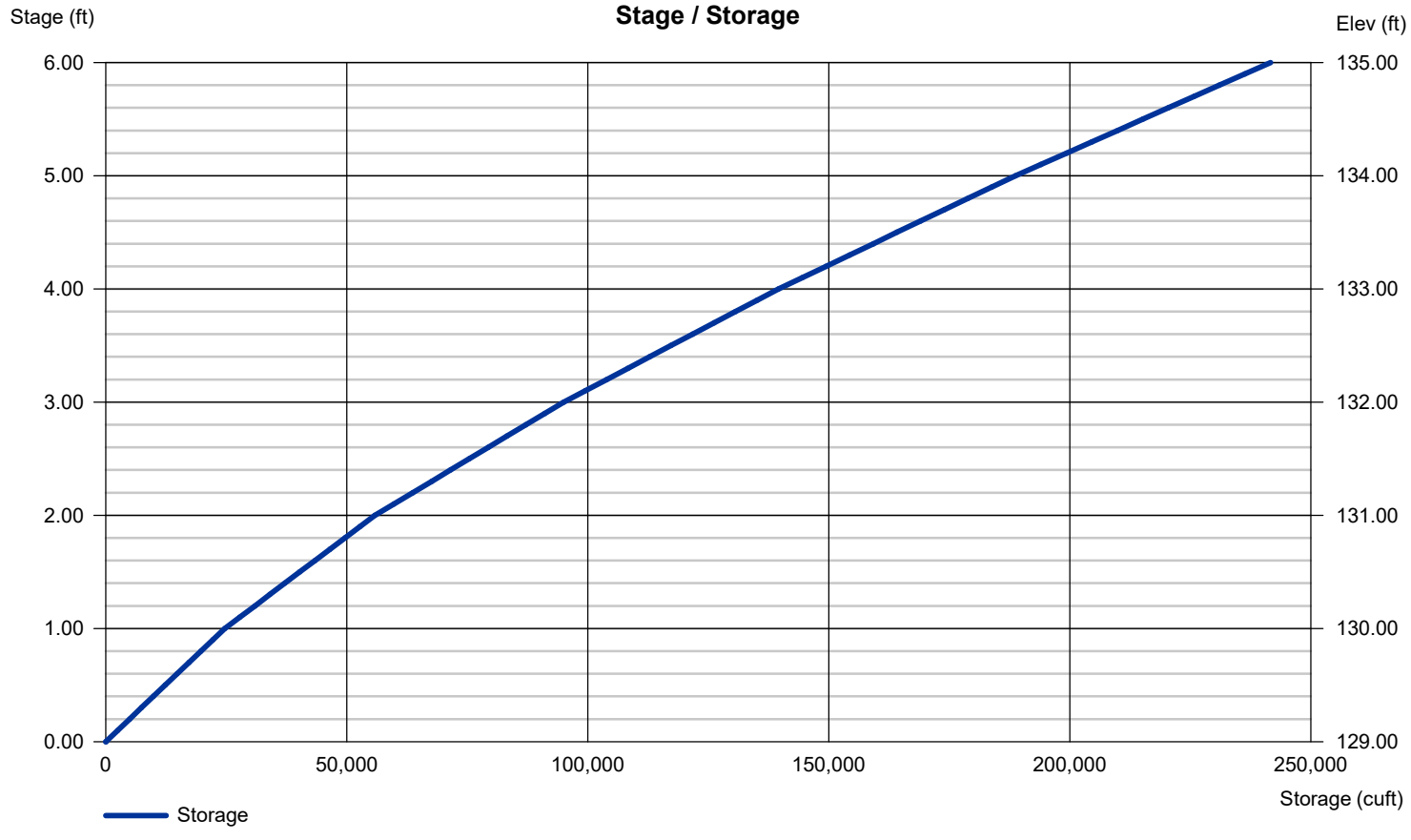
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 128.00	132.00	0.00	0.00
Length (ft)	= 141.00	0.50	0.00	0.00
Slope (%)	= 0.71	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	30.00	30.00	0.00
Crest El. (ft)	= 133.50	133.00	134.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Rect	Rect	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 10.000 (by Contour)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Type/Node Name: **B6-2 Dry Extended Detention Pond with Micro Pool**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable

0.88	ac	A = Area draining to the practice	
-	ac	A_I = Impervious area draining to the practice	
-	decimal	I = percent impervious area draining to the practice, in decimal form	
0.05	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.04	ac-in	WQV= 1" x Rv x A	
160	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
16	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
80	cf	50% x WQV (check calc for extended detention volume)	
N/A	cf	V_{SED} = sediment forebay volume	← ≥ 10%WQV
1,920	cf	V_{PP} = permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
no	cf	Extended Detention?[1]	← ≤ 50% WQV
-		V_{ED} = Volume of Extended detention (if "yes is given in box above)	
		E_{ED} = elevation of WQV if "yes" is given in box above[2]	
-	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
	cfs	Q_{EDmax} = discharge at the E_{ED} (attach stage-discharge table)	← <$2Q_{avg}$
-	hours	T_{ED} = drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	← ≥ 24-hrs
4.00	:1	Pond side slopes	← ≥3:1
123.50	ft	Elevation of seasonal high water table	
129.00	ft	Elevation of lowest pond outlet	
118.50	ft	Max floor = maximum elevation of pond bottom (ft)	
115.50	ft	Minimum floor (to maintain depth at less than 8')	← ≤ 8 ft
130.00	ft	Elevation of pond floor[3]	← ≤ Max floor and > Min floor
128.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
180.00	ft	Average Width ([average of the top width + average bottom width]/2)	
0.71	:1	Length to Average Width ratio	← ≥ 3:1
Yes	Yes/No	The perimeter should be curvilinear.	
Yes	Yes/No	The inlet and outlet should be located as far apart as possible.	
No	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:		Small & Shallow perminate pond.	
Min Orifice 6 inch		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
131.90	ft	Peak elevation of the 50-year storm event	
135.00	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	← yes

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.
2. This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description.
3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

Water in this facility has alredy been treated. Therefore the length to wideth ratio is not a critical design criteria.

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 15 - B6-2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 129.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	129.00	13,100	0	0
1.00	130.00	14,900	13,989	13,989
2.00	131.00	16,800	15,839	29,828
3.00	116.00	18,860	17,818	47,646
4.00	133.00	20,900	19,869	67,515
5.00	134.00	23,100	21,989	89,504
6.00	135.00	25,400	24,239	113,743

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	6.00	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 129.00	129.00	0.00	0.00
Length (ft)	= 175.00	0.50	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

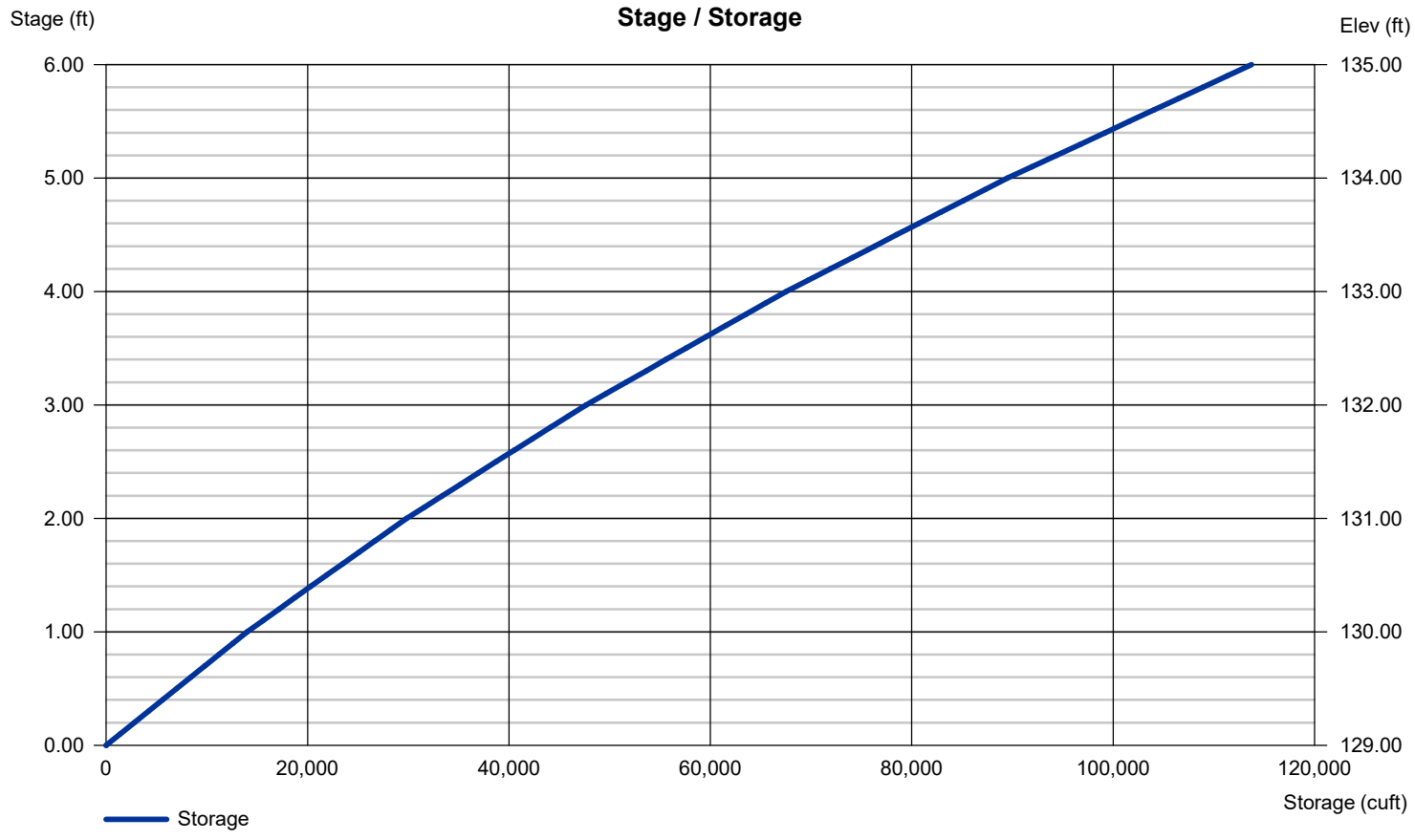
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	Inactive	0.00	0.00
Crest El. (ft)	= 131.00	119.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= Rect	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration Basin B6-3**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
6.14	ac	A = Area draining to the practice	
3.65	ac	A_I = Impervious area draining to the practice	
0.59	decimal	I = percent impervious area draining to the practice, in decimal form	
0.59	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
3.59	ac-in	WQV= 1" x Rv x A	
13,039	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
3,260	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
7,400	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
26,986	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
14,000	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
3.7	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
132.00	feet	E_{BTM} = elevation of the bottom of the basin	
125.50	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
114.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
6.50	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
18.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
133.18	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
133.78	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
135.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 — Wednesday, 08 / 12 / 2020

Pond No. 16 - B6-3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 132.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	132.00	24,600	0	0
1.00	133.00	29,450	26,986	26,986
2.00	134.00	34,300	31,841	58,827
3.00	135.00	39,400	36,817	95,644

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	Inactive	0.00	0.00
Span (in)	= 12.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 131.00	132.50	0.00	0.00
Length (ft)	= 30.00	0.50	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

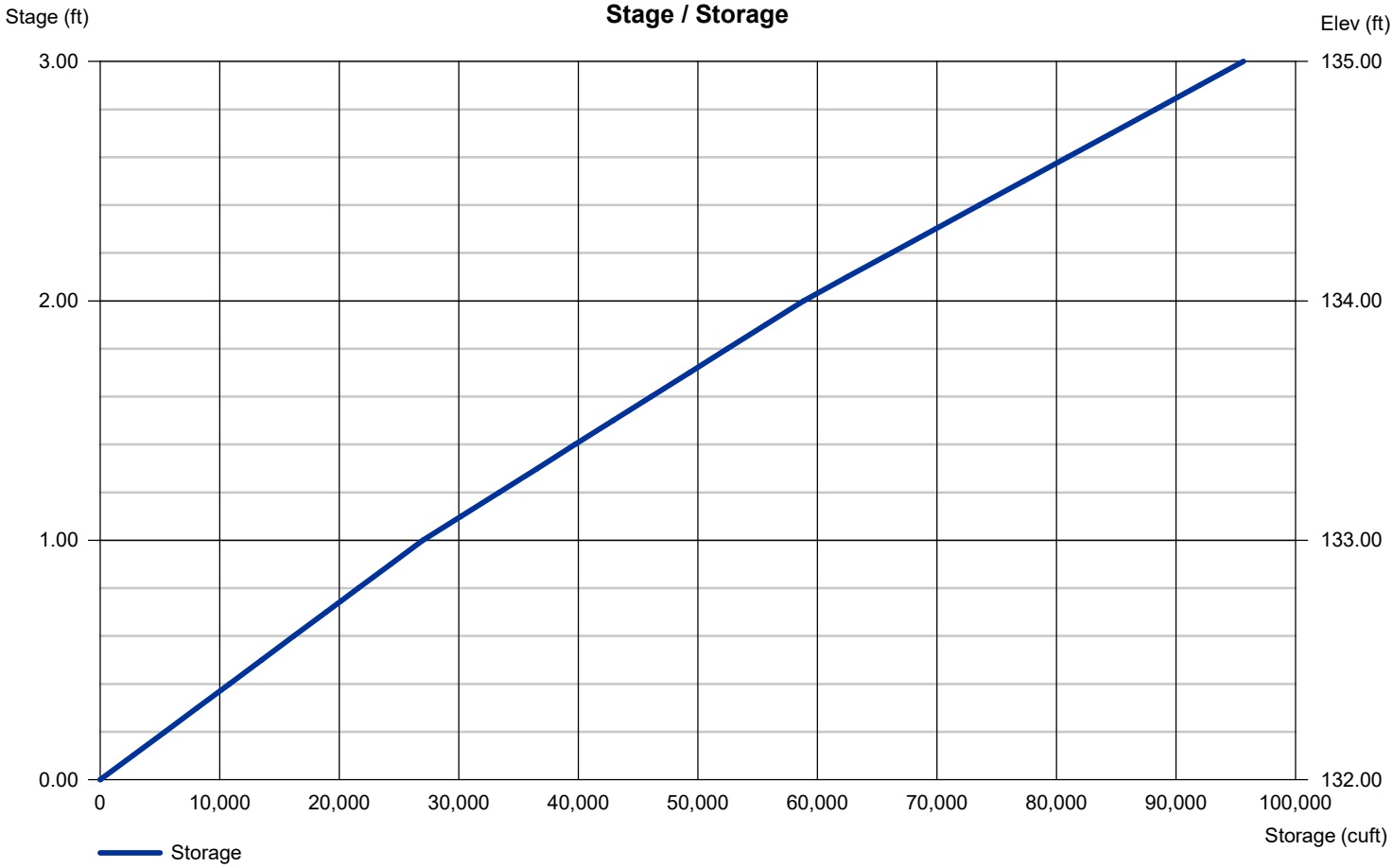
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.50	10.00	0.00
Crest El. (ft)	= 133.75	133.00	134.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	Yes	No

Exfil.(in/hr) = 3.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Infiltration Basin B6-4**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
13.70	ac	A = Area draining to the practice	
8.14	ac	A_I = Impervious area draining to the practice	
0.59	decimal	I = percent impervious area draining to the practice, in decimal form	
0.58	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
8.01	ac-in	WQV= 1" x Rv x A	
29,080	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
7,270	cf	25% x WQV (check calc for sediment forebay volume)	
Sed. Forebay		Method of pretreatment? (not required for clean or roof runoff)	
7,740	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
61,073	cf	V = volume[1] (attach a stage-storage table)	← ≥ WQV
18,800	sf	A_{SA} = surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = design infiltration rate[2]	
6.2	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
131.00	feet	E_{BTM} = elevation of the bottom of the basin	
124.50	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
122.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
6.50	feet	D_{SHWT} = separation from SHWT	← ≥ *[3]
9.0	feet	D_{ROCK} = separation from bedrock	← ≥ *[3]
	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	← ≥ 24"
	ft	D_T = depth of trench, if trench proposed	← 4 - 10 ft
	Yes/No	If a trench or underground system is proposed, observation well provided[4]	
		If a trench is proposed, material in trench	
On-site Soils		If a basin is proposed, basin floor material	
Yes	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
4.0	:1	If a basin is proposed, pond side slopes	← ≥3:1
133.36	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
133.97	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
135.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020 Wednesday, 08 / 12 / 2020

Pond No. 17 - B6-4

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 131.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	131.00	22,800	0	0
1.00	132.00	30,600	26,602	26,602
2.00	133.00	38,500	34,471	61,073
3.00	134.00	46,500	42,433	103,506
4.00	135.00	54,600	50,491	153,997

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	Inactive	0.00	0.00
Span (in)	= 24.00	6.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 130.00	127.00	0.00	0.00
Length (ft)	= 35.00	0.50	0.00	0.00
Slope (%)	= 3.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	2.00	30.00	0.00
Crest El. (ft)	= 133.50	133.00	134.00	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	Yes	No

Exfil.(in/hr) = 3.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Groundwater Recharge Volume (GRV) Calculation

7.72	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
129.18	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
-	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
6.37	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.25	inches	Rd = weighted groundwater recharge depth	
35.383	ac-in	GRV = AI * Rd	
128,543	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Water Quality Volume & Groundwater Recharge Compliance (CF)

	WQv	In Excess of Required
Required	501,270	
90% TSS Provided	788,543	287,273
80% TSS Provided	30,000	30,000
TBD% TSS Dry Ext. Det.	29,828	29,828

	GRv	
Required	128,440	
Total Provided	788,543	660,103

BMP Sizing Summary Chart (CF Unless otherwise noted)

Stormwater Feature	TSS Removal	Watershed	WQv (Required)	WQv (Provided)	Pre-treatment (Required)	Pre-treatment (Provided)	GRv (Provided)
Infiltration Basin	90%	A1-2	446	43,200	112	N/A	43,200
Infiltration Basin	90%	A1-3	44,163	56,919	4,416	23,400	56,919
Infiltration Basin	90%	A1-4	105,363	106,654	26,341	29,700	106,654
Infiltration Basin	90%	A1-5	33,986	50,888	8,497	9,390	50,888
Infiltration Basin	90%	A1-6	38,030	104,304	9,508	14,000	104,304
Hydrodynamic Unit	80%	A1-7	4.697 CFS	8.82 CFS	-	-	-
			or	or			
			16,533	30,000			-
Infiltration Basin	90%	A6-2	84,815	95,837	21,204	22,650	95,837
Infiltration Basin	90%	A11-2	94,783	135,495	23,696	26,320	135,495
Infiltration Basin	90%	A11-3	1,454	12,205	364	886	12,205
Infiltration Basin	90%	B1-2	39,418	94,982	9,855	13,380	94,982
Sediment Forebay	TBD	B1-2A	-	-	1,381	3,480	-
Sediment Forebay	TBD	B1-2B	-	-	8,842	9,900	-
Dry Ext. Det. Pond w/ Micro Pool	TBD	B6-2	160	29,828	40	N/A	29,828
Infiltration Basin	90%	B6-3	13,039	26,986	3,260	7,400	26,986
Infiltration Basin	90%	B6-4	29,080	61,073	7,270	7,740	61,073

APPENDIX I

Stormwater Management Report
(Under Separate Cover)

APPENDIX J

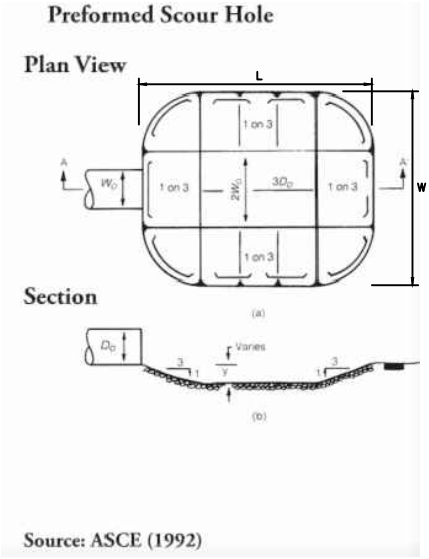
Energy Dissipating Performed Scour Pad Detail
Stone Check Dam Detail

PREFORMED SCOUR HOLE SIZING CHART

W_0 [IN]	$2W_0$ [FT]	$3D_0$ [FT]	Y [FT]	W [FT]	L [FT]	RIPRAP d [IN]
12	2	3	0.5	5	6	6"–12"
15	2.5	3.75	0.625	6.25	7.5	9"–15"
18	3	4.5	0.75	7.5	9	9"–15"
24	4	6	1	10	12	12"–18"
30	5	6.5	1.25	12.5	15	12"–18"
36	6	9	1.5	15	18	12"–18"
42	7	10.5	1.75	17.5	21	12"–18"
48	8	12	2	20	24	12"–18"
60	10	15	2.5	25	30	12"–18"
72	12	18	3	30	36	12"–18"

NOTES:

RIPRAP IS TO BE WELL GRADED. OPTIMUM GRADATION OF RIPRAP IS 50 PERCENT OF THE STONE BY WEIGHT IS TO BE SMALLER THAN THE MEDIAN STONE DIAMETER. APPROXIMATE RIPRAP DIAMETER IS INDICATED IN THE ABOVE SIZING CHART AS d [IN].



PREFORMED SCOUR HOLE

N.T.S

SOURCE: HUDSON LOGISTICS CENTER, SITE PLAN & WETLANDS CONDITIONAL USE APPLICATIONS, BY LANGAN, SHEET CG502

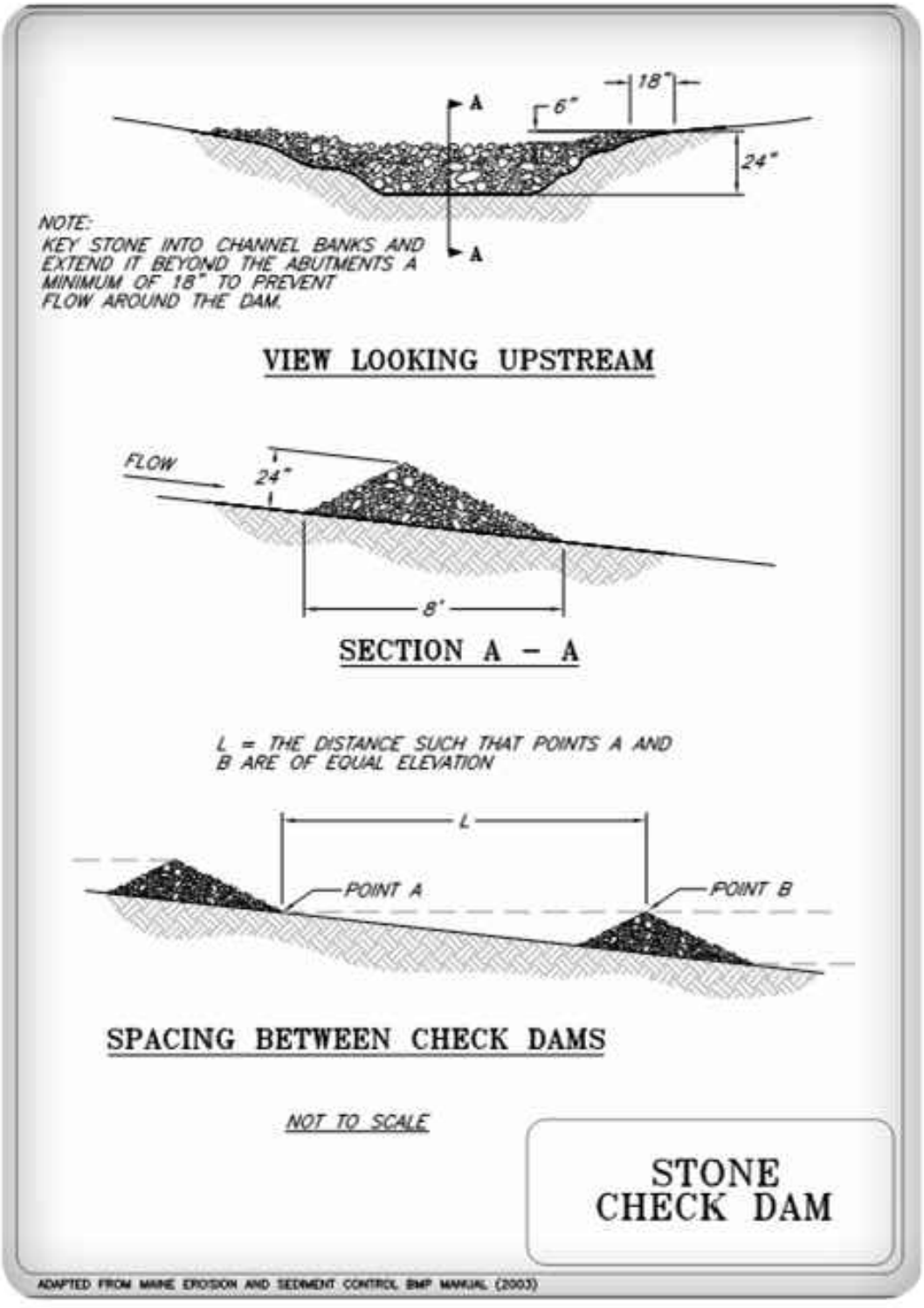
LANGAN
Langan Engineering and Environmental Services, Inc.
888 Boylston Street, Suite 510
Boston, MA 02199
T: 617.824.9100 www.langan.com

Project: HUDSON LOGISTICS CENTER
HUDSON NEW HAMPSHIRE

Drawing Title: APPENDIX J

Project No. 151010101
Date 06/22/2020
Drawn By RJS
Checked By NLK

Drawing No. FIG. 01
Sheet 1 of 1



2

24 INCH STONE CHECK DAM

N.T.S SOURCE: NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3

LANGAN
Langan Engineering and Environmental Services, Inc.
888 Boylston Street, Suite 510
Boston, MA 02199
T: 617.824.9100 www.langan.com

Project	HUDSON LOGISTICS CENTER
	HUDSON NEW HAMPSHIRE
Drawing Title	APPENDIX J
Project No.	151010101
Date	06/22/2020
Drawn By	RJS
Checked By	NLK
Drawing No.	FIG.02
Sheet	1 of 1

APPENDIX L

Infiltration Feasibility Report

Infiltration Feasibility Report

Hudson Logistic Center
Hudson, New Hampshire
May 2020
Revised: September 2020

TABLE OF CONTENTS:

LANGAN

The project proposes eleven systems that require infiltration to function properly. These systems are identified on the plans as Infiltration Basin A1-2, A1-3, A1-4, A1-5, A1-6, A11-2, A11-3, A6-2, B1-2, B6-3, and B6-4.

I. Location of the practice

Infiltration Basin A1-2 – This basin is located on the west side of the site on Lot A, to the east of Merrimack River.

Infiltration Basin A1-3 – This basin is located on the west side of the site, in the existing parking area on Lot A.

Infiltration Basin A1-4 – This basin is located at the northern extent between Lot B and C, to the south of the main entrance drive of Lot B.

Infiltration Basin A1-5 – This basin is located near the center of the site, to the west of the wetlands on Lot C.

Infiltration Basin A1-6 – This basin is located along the northern property line of Lot C. South of the Lot B main entrance drive, north of the Lot C parking and truck court access drive, and south west of the cul-de-sac.

Infiltration Basin A6-2 – This basin is located at the northwestern corner of the site on Lot A, west of the main truck court guard house and water tower.

Infiltration Basin A11-2 – This basin is located west of the western Lot B truck court in the southwestern region of the project site.

Infiltration Basin A11-3 – This basin is located near the southwestern corner of the site on Lot B, adjacent to the future emergency access boat ramp.

Infiltration Basin B1-2 – This basin is located on the northeastern side of Lot A at

the intersection of the main Lot A drive way and the secondary access to Walmart Blvd. The basin is located to the west of the wetland series.

Infiltration Basin B6-3 – This basin is located on Lot C to the north east of the eastern truck court, west of the main lot access drive.

Infiltration Basin B6-4 – This basin is located on Lot C to the south east of the eastern truck court, west of the main lot access drive.

II. Existing topography at the location of the practice

Infiltration Basin A1-2 – The existing topography within the area of the infiltration basin is a depression sloping from approximately 20% down to a flat area with a grass cover.

Infiltration Basin A1-3 – The existing topography within the area of the infiltration basin is combination of grass and tree cover and a paved parking area with a gravel drive. The parking area is sloped at 0-5% and the grass area is sloped up to 25%.

Infiltration Basin A1-4 – The existing topography within the area of the infiltration basin is a combination of grass and tree cover sloping at 0-5%.

Infiltration Basin A1-5 – The existing topography within the area of the infiltration basin is a combination of flat area and area sloping 5-15% with a grass cover.

Infiltration Basin A1-6 – The existing topography within the area of the infiltration basin is grass, mostly sloping only 0-5%. At the western end of the basin however, the slope increases up to 15%.

Infiltration Basin A6-2 – The existing topography within the area of the infiltration basin is relatively flat with a combination of grass and forested cover with a sand trap.

Infiltration Basin A11-2 – The existing topography within the area of the infiltration basin is a combination of flat area and area sloping up to 25% with grass cover.

Infiltration Basin A11-3 – The existing topography within the area of the infiltration basin is sloped at 0-15% with grass cover and some trees.

Infiltration Basin B1-2 – The existing topography within the area of the infiltration basin is relatively flat with a combination of grass and forested cover and a sand trap.

Infiltration Basin B6-3 – The existing topography within the area of the infiltration basin is sloped at 0-5% with a combination of grass and forested cover.

Infiltration Basin B6-4 – The existing topography within the area of the infiltration basin is sloped at 0-10% with mostly grass cover, some trees, and an existing road which crosses through the area of the infiltration basin.

III. Test pit or boring locations

In accordance with Env-Wq 1504.12(c), NHDES requires that a minimum number of test pits or borings be dug or drilled in the location of the system, depending on the size of the proposed system.

Infiltration Basin A1-2 – This basin is ±18,600 SF. Multiple borings and or test pits have been performed in the vicinity of this feature, however, no infiltration testing has taken place within the foot print of the proposed infiltration feature. Additional required test will be completed during construction.

Infiltration Basin A1-3 – This basin is ±23,000 SF. Multiple borings and or test pits have been performed in the vicinity of this feature, however, no infiltration testing has taken place within the foot print of the proposed infiltration feature. Additional required test will be completed during construction.

Infiltration Basin A1-4 – This basin is ±13,000 SF. Multiple borings and or test pits have been performed in the vicinity of this feature, however, no infiltration testing has taken place within the foot print of the proposed infiltration feature. Additional required test will be completed during construction.

Infiltration Basin A1-5 – This basin is ±12,900 SF. One test pit has been performed in the proposed infiltration basin location. The test pit is identified as C-S-TP-17 and is shown on the attached plan.

Infiltration Basin A1-6 – This basin is ±28,750 SF. Two test pits have been performed in the proposed infiltration basin location. The test pits are identified as A-S-TP-09 and A-S-TP-15 and are shown on the attached plan.

Infiltration Basin A6-2 – This basin is ±42,900 SF. Two test pits have been performed in the proposed infiltration basin location. The

test pits are identified as A-S-TP-21 and A-S-TP-22 and are shown on the attached plan.

Infiltration Basin A11-2 – This basin is ±71,300 SF. Two test pits have been performed in the proposed infiltration basin location. The test pits are identified as B-S-TP-22 and B-S-TP-23 and are shown on the attached plan.

Infiltration Basin A11-3 – This basin is ±1,100 SF. Multiple borings and or test pits have been performed in the vicinity of this feature, however, no infiltration testing has taken place within the foot print of the proposed infiltration feature. Additional required test will be completed during construction.

Infiltration Basin B1-2 – This basin is ±23,219 SF. Two test pits have been performed in the proposed infiltration basin location. The test pits are identified as A-S-TP-01 and A-S-TP-02 and are shown on the attached plan.

Infiltration Basin B6-3 – This basin is ±24,600 SF. One test pit has been performed in the proposed infiltration basin location. The test pit is identified as C-S-TP-01 and is shown on the attached plan.

Infiltration Basin B6-4 – This basin is ±22,800 SF. Multiple borings and or test pits have been performed in the vicinity of this feature, however, no infiltration testing has taken place within the foot print of the proposed infiltration feature. Additional required test will be completed during construction.

IV. Seasonal high water table (SHWT) and bedrock elevations

Infiltration Basin A1-2

Required, additional testing to be completed during construction.

Bottom of Pond Elevation = 114.0

TP#: Existing Surface Elevation of TP =
SHWT = 111.0 (Based on surrounding boring information)
BEDROCK = 111.0 (Based on surrounding boring information)
Deepest Elevation of TP =

Infiltration Basin A1-3

Required, additional testing to be completed during construction.

Bottom of Pond Elevation = 128.0

TP#: Existing Surface Elevation of TP =
SHWT = 123.0 (Based on surrounding boring information)
BEDROCK = 115.0 (Based on surrounding boring information)
Deepest Elevation of TP =

Infiltration Basin A1-4

Required, additional testing to be completed during construction.

Bottom of Pond Elevation = 133.0

TP#: Existing Surface Elevation of TP =
SHWT = 129.0 (Based on surrounding boring information)
BEDROCK = 123.0 (Based on surrounding boring information)
Deepest Elevation of TP =

Infiltration Basin A1-5 – This test pit data was collected on 6/17/2020.

Bottom of Pond Elevation = 131.0

C-S-TP-17: Existing Surface Elevation of TP = 133.0
SHWT = 126.0
BEDROCK = 115.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 130.5

Infiltration Basin A1-6 – This test pit data was collected on 6/5/2020 & 6/23/2020.

Bottom of Pond Elevation = 130.0

A-S-TP-09: Existing Surface Elevation of TP = 132.5
SHWT = 125.5
BEDROCK = 115.5 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 130.5

A-S-TP-15: Existing Surface Elevation of TP = 137.0
SHWT = 129.5
BEDROCK = 115.5 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 132.5

Infiltration Basin A6-2 – This test pit data was collected on 6/29/2020.
Bottom of Pond Elevation = 114.0

A-S-TP-21: Existing Surface Elevation of TP = 115.0
SHWT = 103.5 (Not encountered in test pit, based on surrounding boring information)
BEDROCK = 130.5 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 112.0

A-S-TP-22: Existing Surface Elevation of TP = 114.0
SHWT = 103.5 (Not encountered in test pit, based on surrounding boring information)
BEDROCK = 130.5 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 110.0

Infiltration Basin A11-2 – This test pit data was collected on 6/29/2020.
Bottom of Pond Elevation = 114.0

B-S-TP-22: Existing Surface Elevation of TP = 115
SHWT = 105.0 (Not encountered in test pit, based on surrounding boring information)
BEDROCK = 105.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 111.0

B-S-TP-23: Existing Surface Elevation of TP = 115.5
SHWT = 105.0 (Not encountered in test pit, based on surrounding boring information)

BEDROCK = 105.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 113.5

Infiltration Basin A11-3

Required, additional testing to be completed during construction.

Bottom of Pond Elevation = 108.0

TP#: Existing Surface Elevation of TP =
SHWT = 94.0 (Based on surrounding boring information)
BEDROCK = 84.0 (Based on surrounding boring information)
Deepest Elevation of TP =

Infiltration Basin B1-2 – This test pit data was collected on 6/24/2020 – 6/25/2020.

Bottom of Pond Elevation = 129.0

A-S-TP-01: Existing Surface Elevation of TP = 135.5
SHWT = 126.0 (Not encountered in test pit, based on surrounding boring information)
BEDROCK = 125.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 128.5

A-S-TP-02: Existing Surface Elevation of TP = 133
SHWT = 126.0 (Not encountered in test pit, based on surrounding boring information)
BEDROCK = 125.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 128.0

Infiltration Basin B6-3 – This test pit data was collected on 6/17/2020 – 6-18-2020.

Bottom of Pond Elevation = 132.0

C-S-TP-01: Existing Surface Elevation of TP = 127.5
SHWT = 120.4
BEDROCK = 114.0 (Not encountered in test pit, based on surrounding boring information)
Deepest Elevation of TP = 123.5

Infiltration Basin B6-4

Required, additional testing to be completed during construction.

Bottom of Pond Elevation = 131.0

TP#: Existing Surface Elevation of TP =
SHWT = 124.5 (Based on surrounding boring information)
BEDROCK = 122.0 (Based on surrounding boring information)
Deepest Elevation of TP =

V. Profile descriptions

Infiltration Basin A1-2 – Required, additional testing to be completed during construction.

Infiltration Basin A1-3 – Required, additional testing to be completed during construction.

Infiltration Basin A1-4 – Required, additional testing to be completed during construction.

Infiltration Basin A1-5

C-S-TP-17	Light brown silty fine SAND, some fine-medium sand lenses

Infiltration Basin A1-6

A-S-TP-09	Grayish brown fine-medium SAND, some silt, trace fine gravel
A-S-TP-15	Brown medium SAND, trace silt

Infiltration Basin A6-2

A-S-TP-21	Light brown SILT, some fine sand, trace fine gravel
A-S-TP-22	Light brown SILT, trace fine sand, trace roots

Infiltration Basin A11-2

B-S-TP-22	Light brown to brown fine-medium SAND, some silt, trace fine-coarse gravel, trace roots, trace plastic, trace organics [FILL]
B-S-TP-23	Light brown fine-coarse SAND, trace silt, trace fine gravel

Infiltration Basin A11-3 – Required, additional testing to be completed during construction.

Infiltration Basin B1-2

A-S-TP-01	Light brown fine SAND, trace silt
A-S-TP-02	Light brown fine SAND, some silt

Infiltration Basin B6-3

C-S-TP-01 (This area would be a fill. Existing grade of C-S-TP-01 is 127.5.)

Infiltration Basin B6-4 – Required, additional testing to be completed during construction.

VI. Soil plan in the area of the proposed practice(s)

(See attached)

VII. Summary of [Default, Field Testing, or Lab Testing] data used to determine the infiltration rate

Infiltration Basin A1-2

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL & 24 Agawam.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin A1-3

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 699 Urban Land (closets proximity 24 Agawam).

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 24 Agawam (Ksat high C) 100 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 50 in/hr.

Infiltration Basin A1-4

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 24 Agawam.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 24 Agawam (Ksat high C) 100 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 50 in/hr.

Infiltration Basin A1-5

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL & 24 Agawam.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin A1-6

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as

513 Ninigret FSL.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret FSL (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin A6-2

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret FSL (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin A11-2

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL & 24 Agawam.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin A11-3

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL & 24 Agawam.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin B1-2

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret FSL (Ksat high C) 20 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 10 in/hr.

Infiltration Basin B6-3

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat low C) 6 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 3 in/hr.

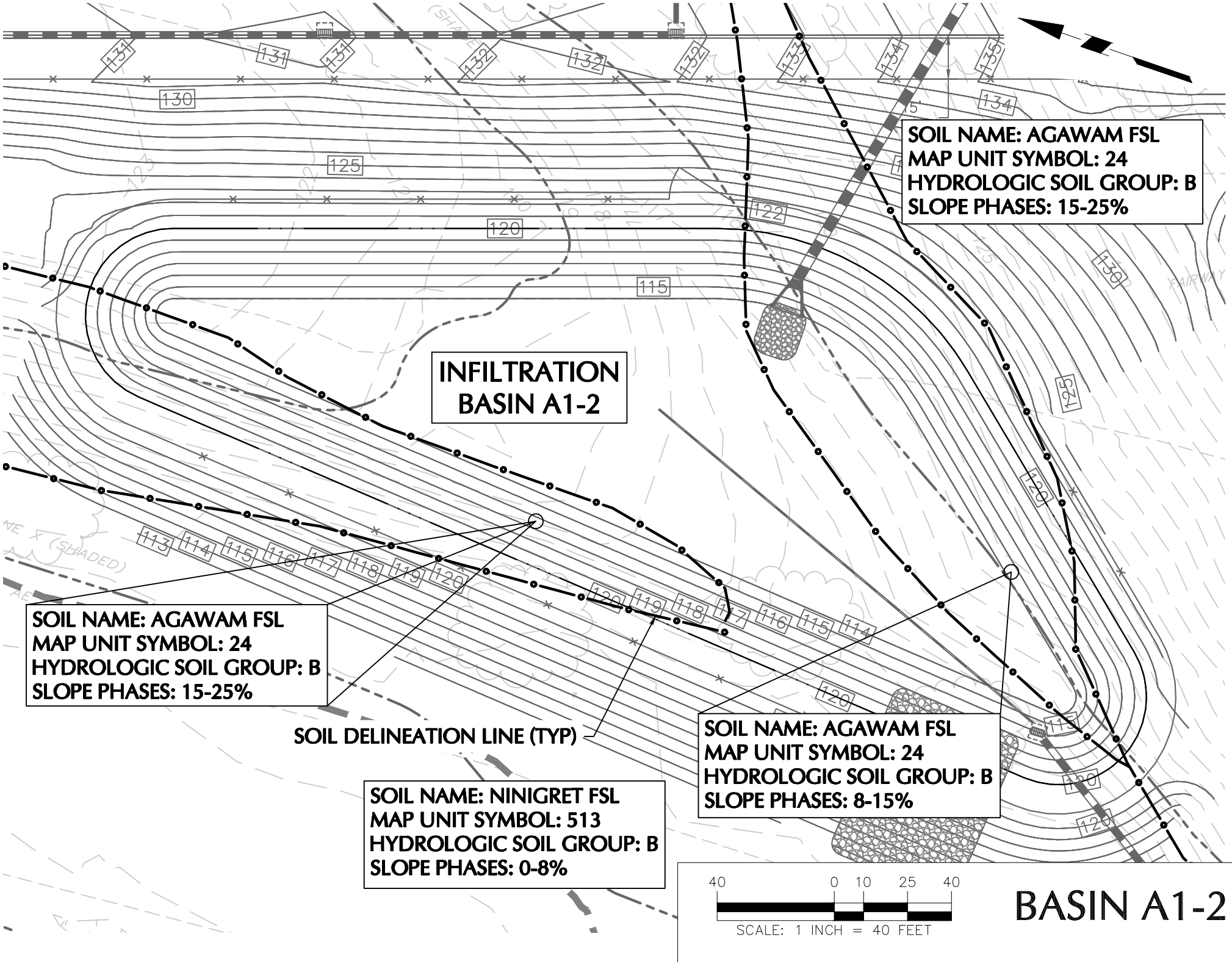
Infiltration Basin B6-4

The infiltration rate was determined using the Field Measurement method described in Env-Wq 1504.14.

The basin is located within native material identified in the Soil Series survey as 513 Ninigret FSL.

Using Ksat Values for New Hampshire Soils, Society of Soil Scientist of Northern New England, Special Publication No.5, September 2009, the lowest value under the basin floor elevation is: 513 Ninigret (Ksat low C) 6 in/hr

After applying a factor of safety, the design rate used in the drainage analysis is 3 in/hr.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MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 15-25%
INFILTRATION BASIN A1-2
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 15-25%
SOIL DELINEATION LINE (TYP)
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
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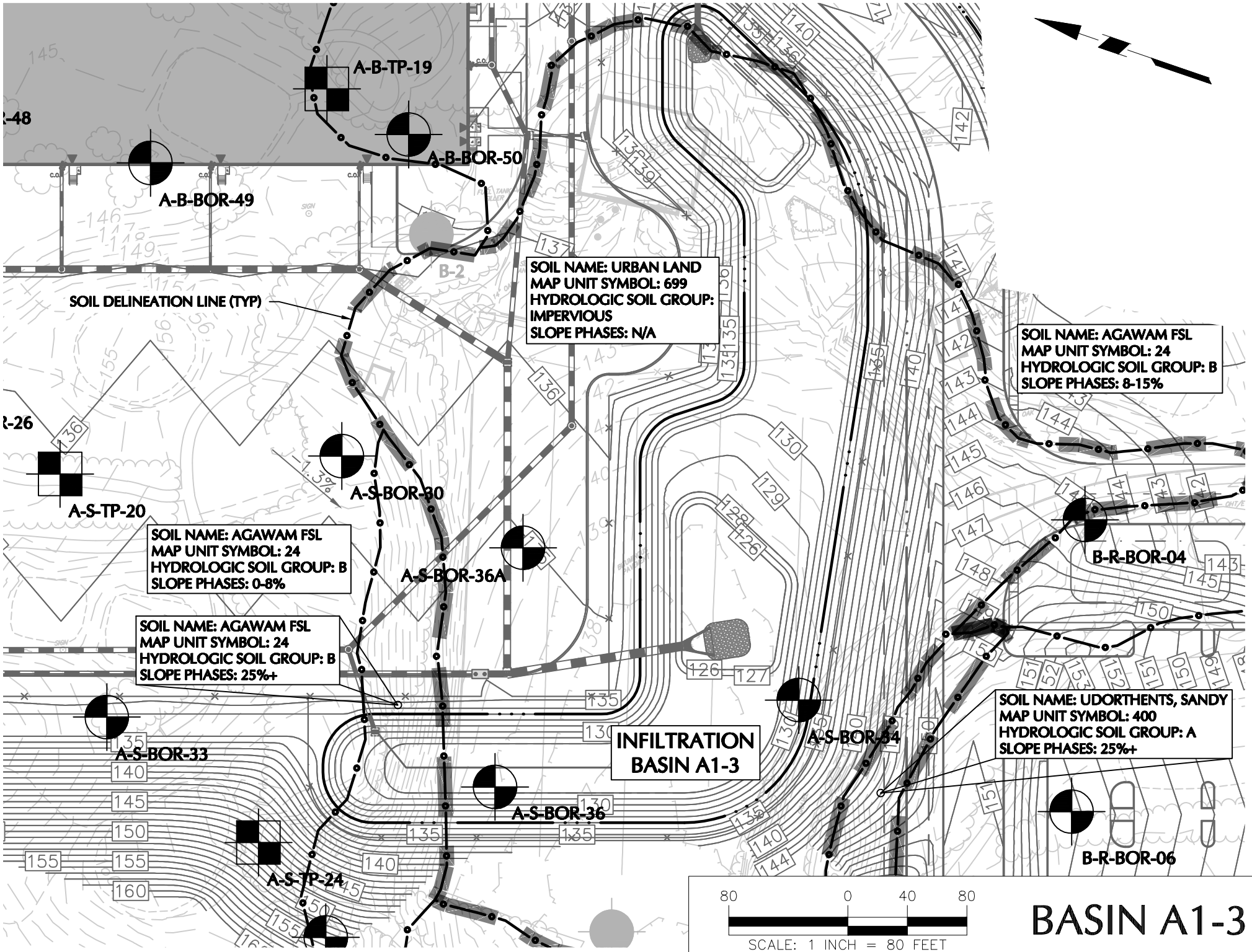
SCALE: 1 INCH = 40 FEET
BASIN A1-2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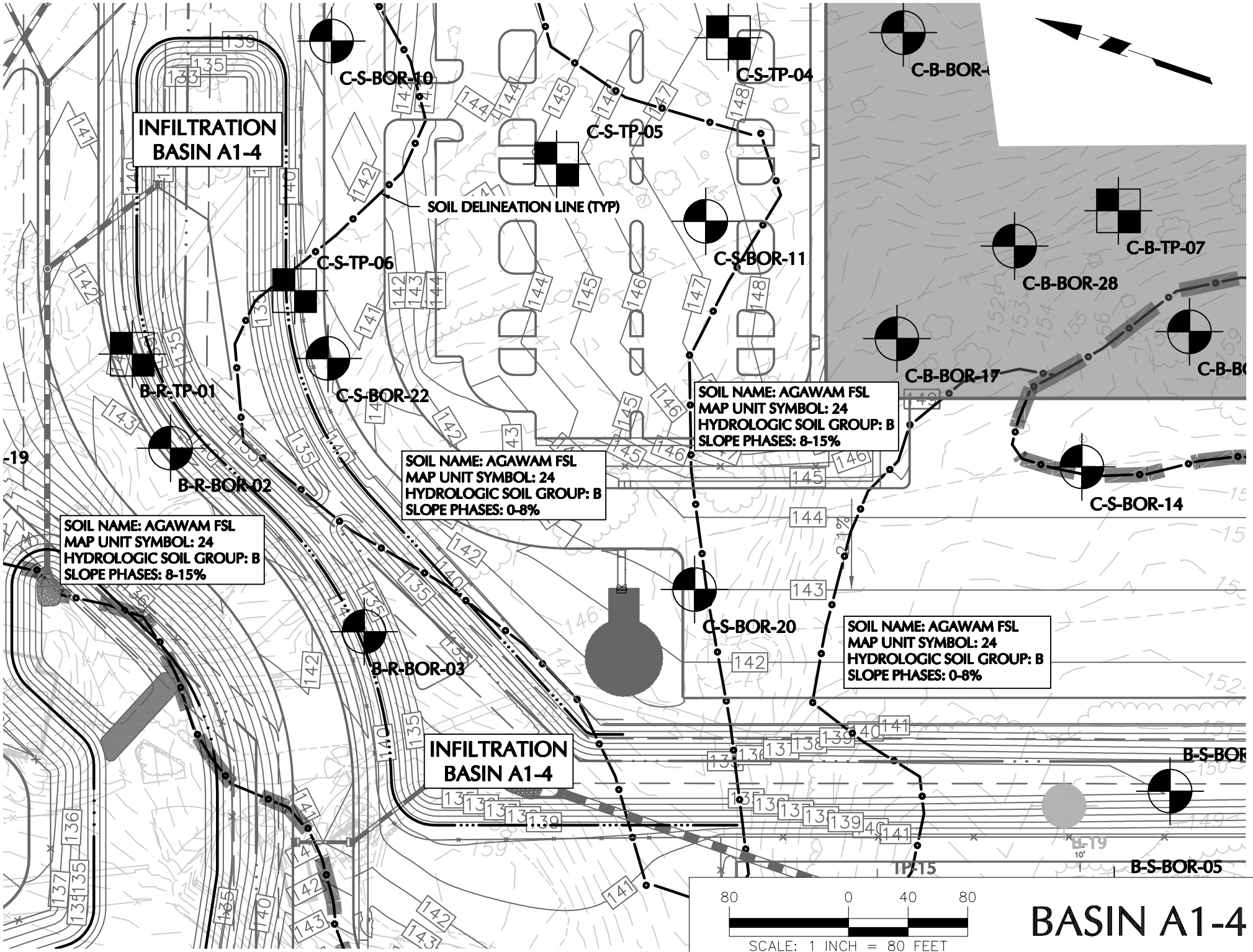
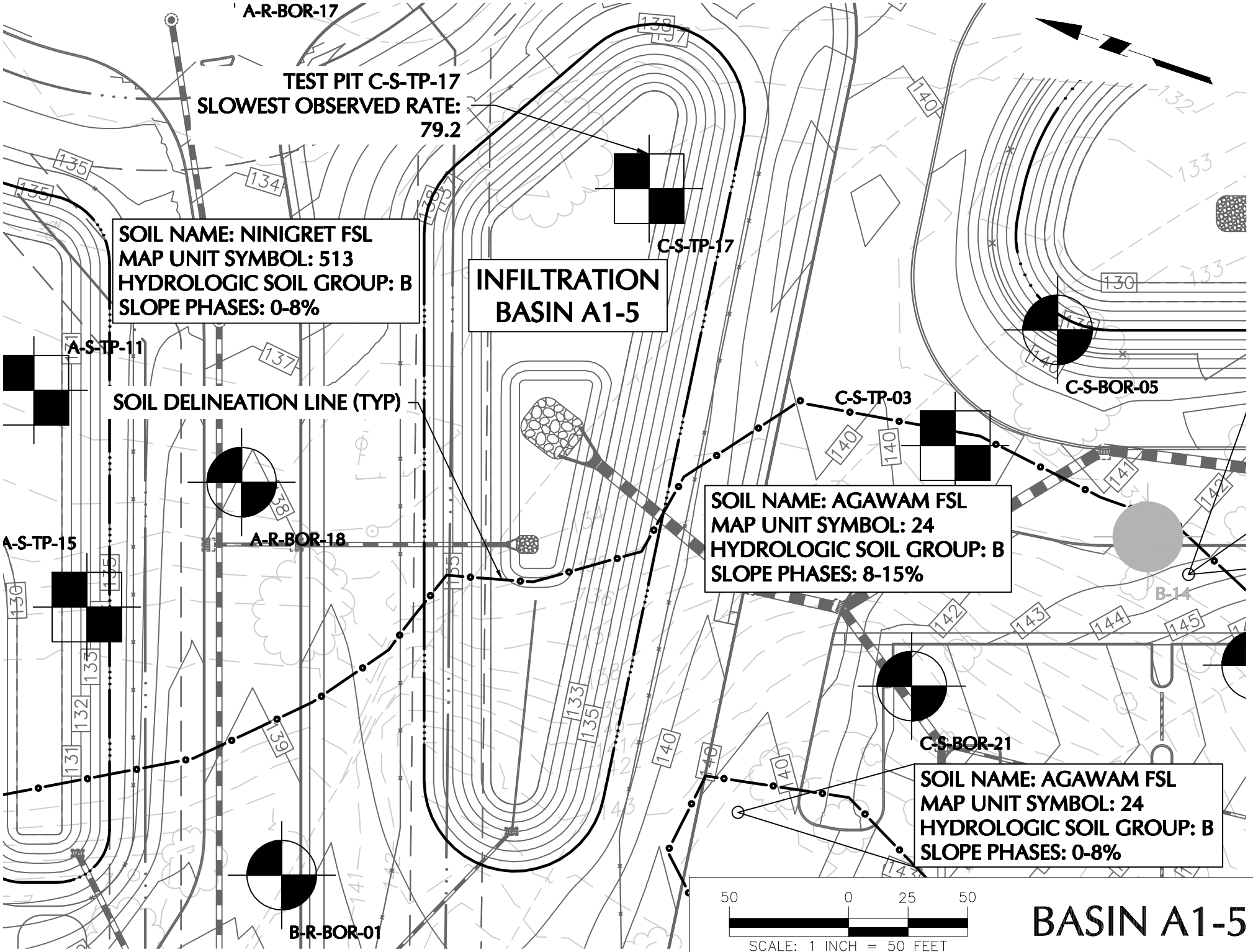
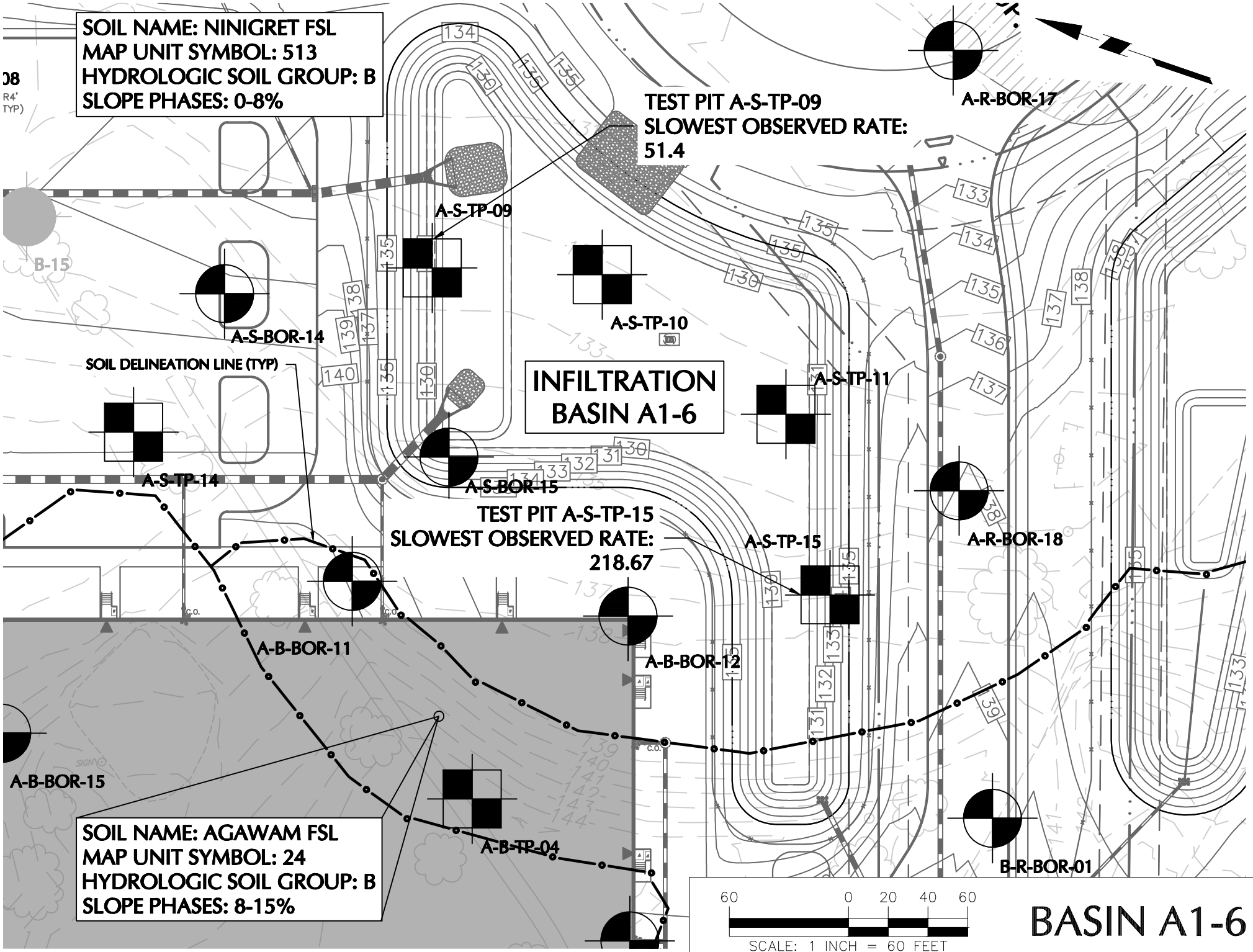
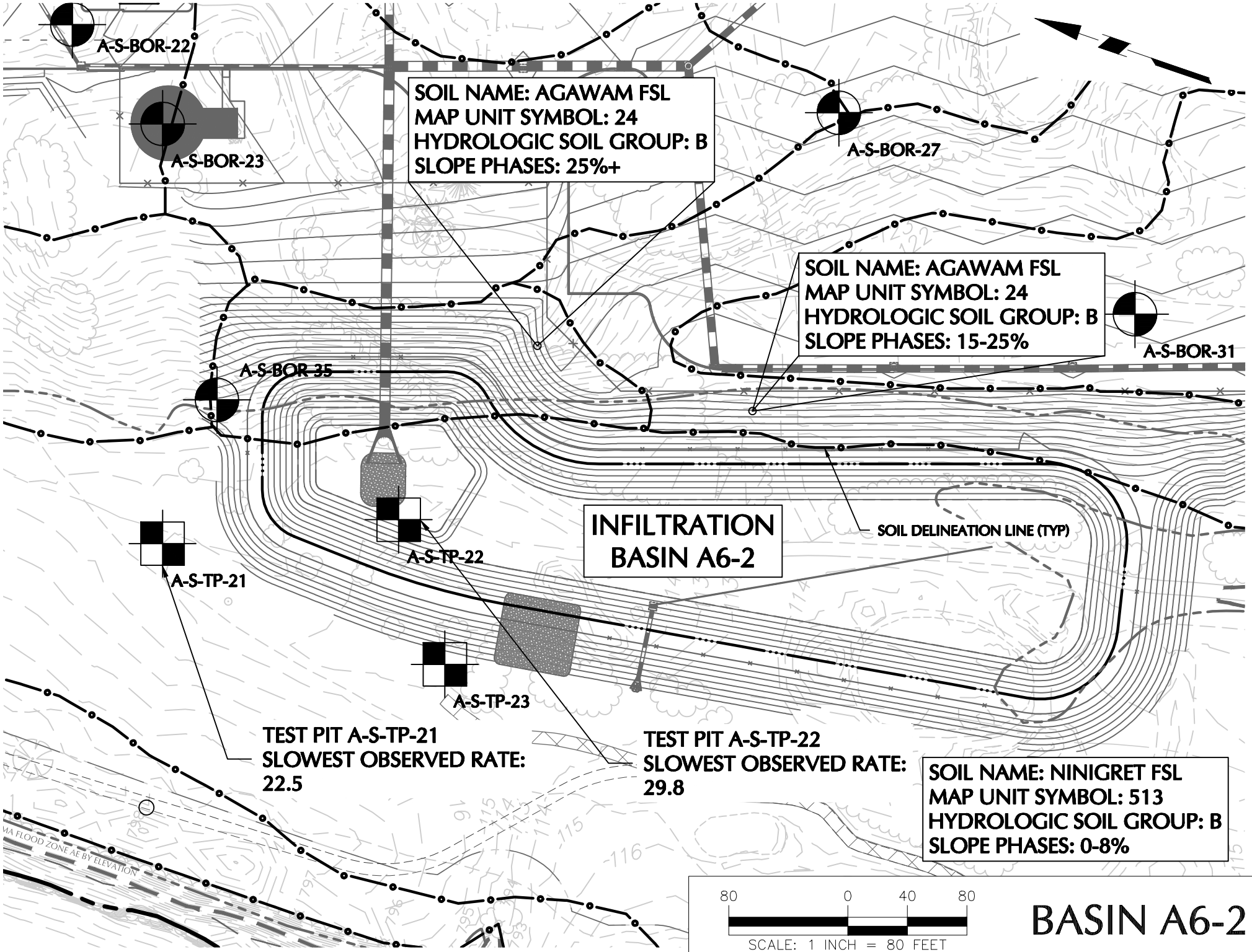
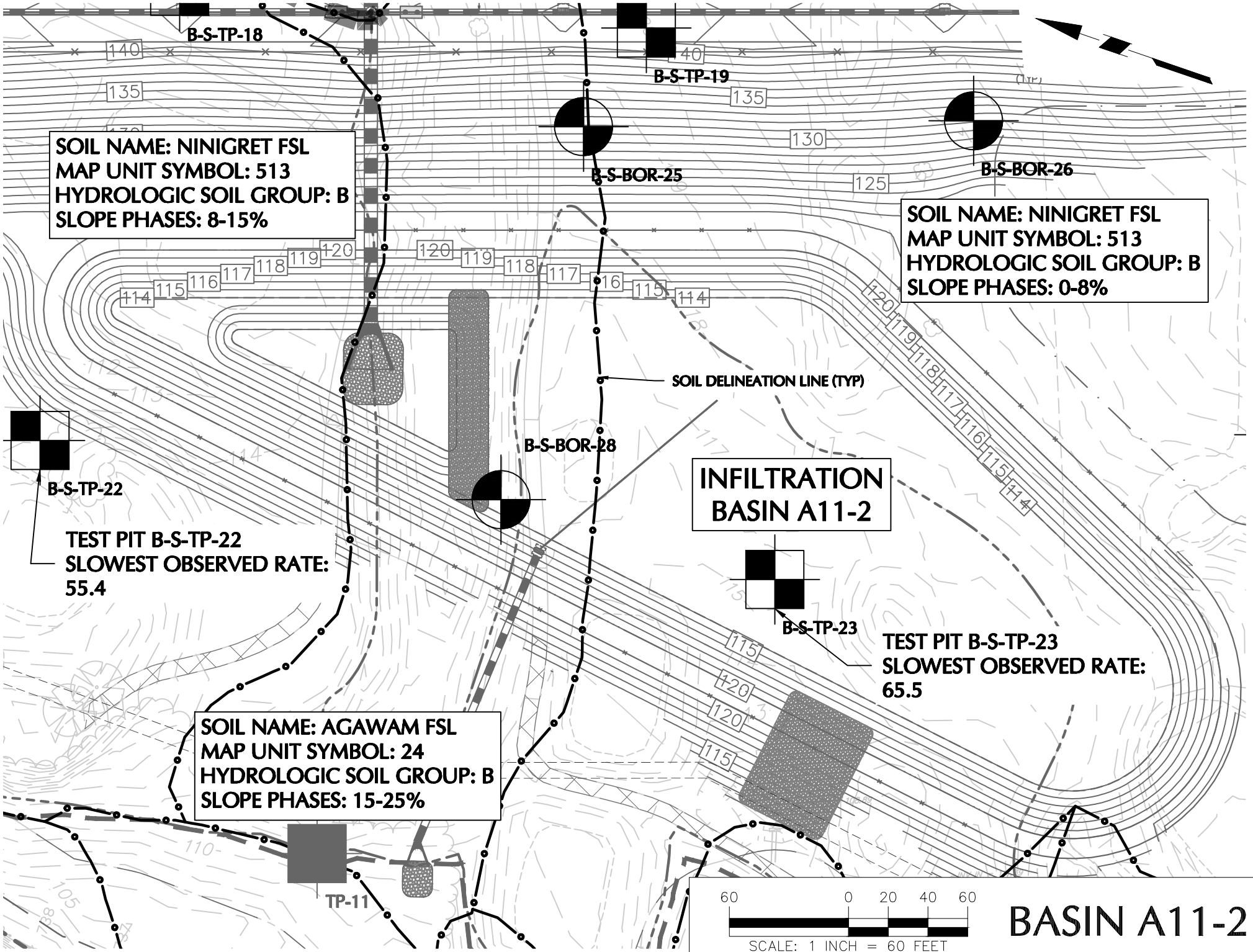
A-B-BOR-50
A-B-BOR-49
B-2
SOIL DELINEATION LINE (TYP)
SOIL NAME: URBAN LAND
MAP UNIT SYMBOL: 699
HYDROLOGIC SOIL GROUP:
IMPERVIOUS
SLOPE PHASES: N/A
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
A-S-TP-20
A-S-BOR-30
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
A-S-BOR-36A
B-R-BOR-04
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 25%+
A-S-BOR-33
INFILTRATION
BASIN A1-3
A-S-BOR-34
SOIL NAME: UDORTHENTS, SANDY
MAP UNIT SYMBOL: 400
HYDROLOGIC SOIL GROUP: A
SLOPE PHASES: 25%+
A-S-BOR-36
A-S-TP-24
B-R-BOR-06
80 0 40 80
SCALE: 1 INCH = 80 FEET
BASIN A1-3

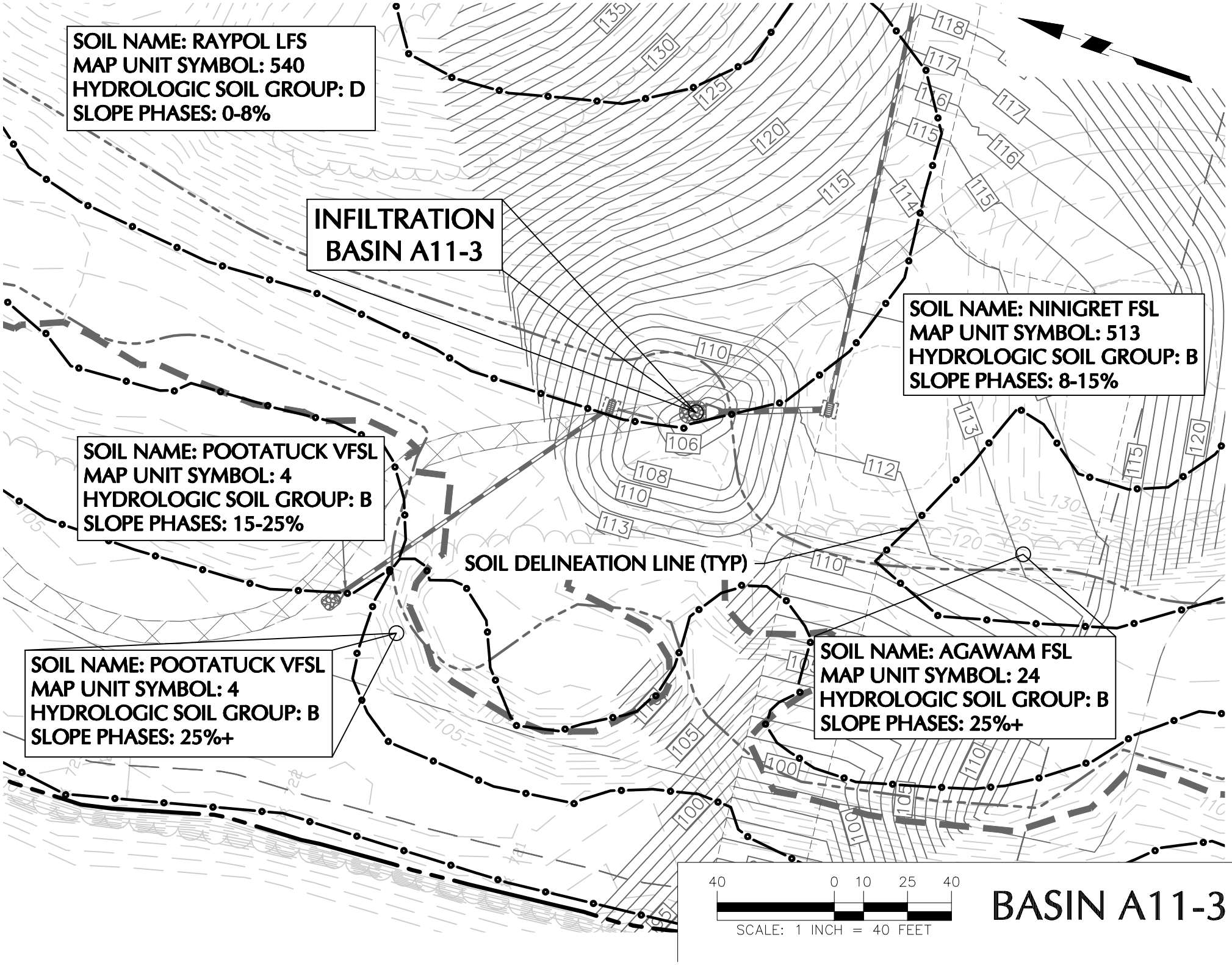

INFILTRATION BASIN A1-4
C-S-BOR-10
C-S-TP-04
C-S-TP-05
SOIL DELINEATION LINE (TYP)
C-S-TP-06
C-S-BOR-11
C-B-TP-07
C-B-BOR-28
C-B-BOR-17
B-R-TP-01
C-S-BOR-22
B-R-BOR-02
C-S-BOR-14
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
C-S-BOR-20
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
B-R-BOR-03
INFILTRATION BASIN A1-4
B-S-BOR
B-S-BOR-05
TP-15
B-T9
80 0 40 80
SCALE: 1 INCH = 80 FEET
BASIN A1-4

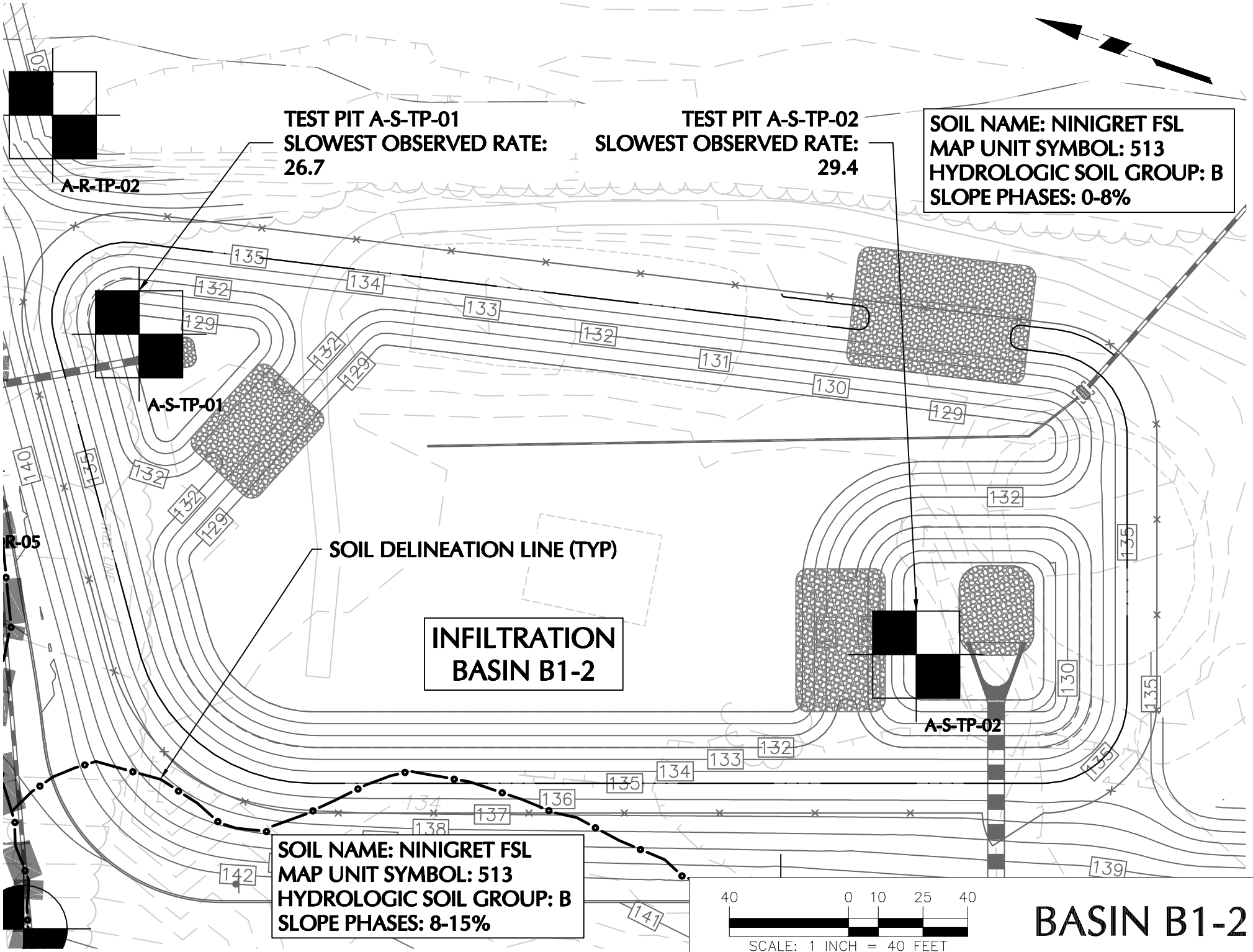

A-R-BOR-17
TEST PIT C-S-TP-17
SLOWEST OBSERVED RATE:
79.2
C-S-TP-17
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
INFILTRATION
BASIN A1-5
A-S-TP-11
SOIL DELINEATION LINE (TYP)
C-S-TP-03
C-S-BOR-05
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
A-S-TP-15
A-R-BOR-18
B-14
C-S-BOR-21
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
B-R-BOR-01
50 0 25 50
SCALE: 1 INCH = 50 FEET
BASIN A1-5

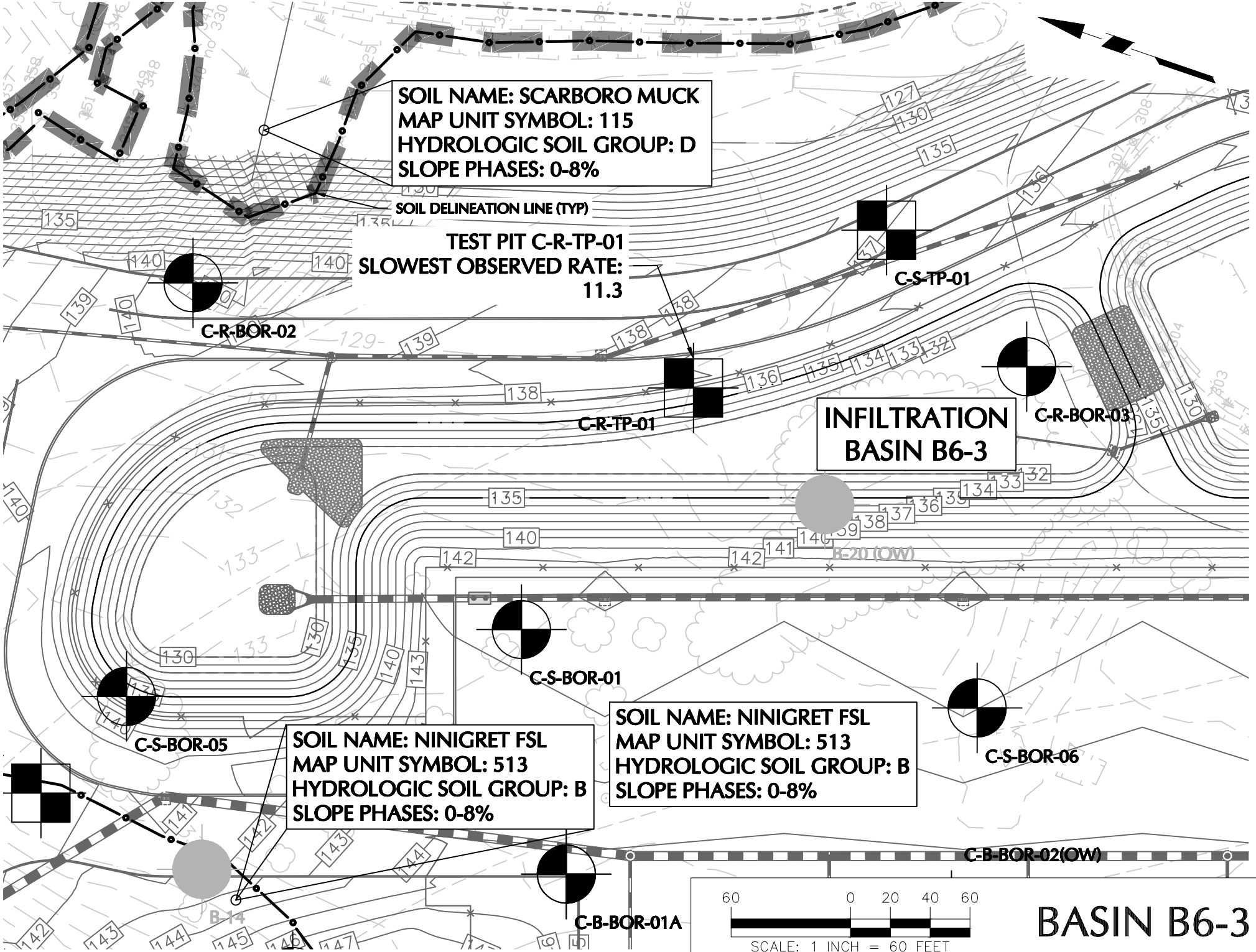

SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
TEST PIT A-S-TP-09
SLOWEST OBSERVED RATE:
51.4
A-S-TP-09
A-S-TP-10
A-S-BOR-14
A-R-BOR-17
B-15
SOIL DELINEATION LINE (TYP)
INFILTRATION
BASIN A1-6
A-S-TP-11
A-S-TP-14
A-S-BOR-15
TEST PIT A-S-TP-15
SLOWEST OBSERVED RATE:
218.67
A-S-TP-15
A-R-BOR-18
A-B-BOR-11
A-B-BOR-12
A-B-BOR-15
A-B-TP-04
B-R-BOR-01
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
60 0 20 40 60
SCALE: 1 INCH = 60 FEET
BASIN A1-6

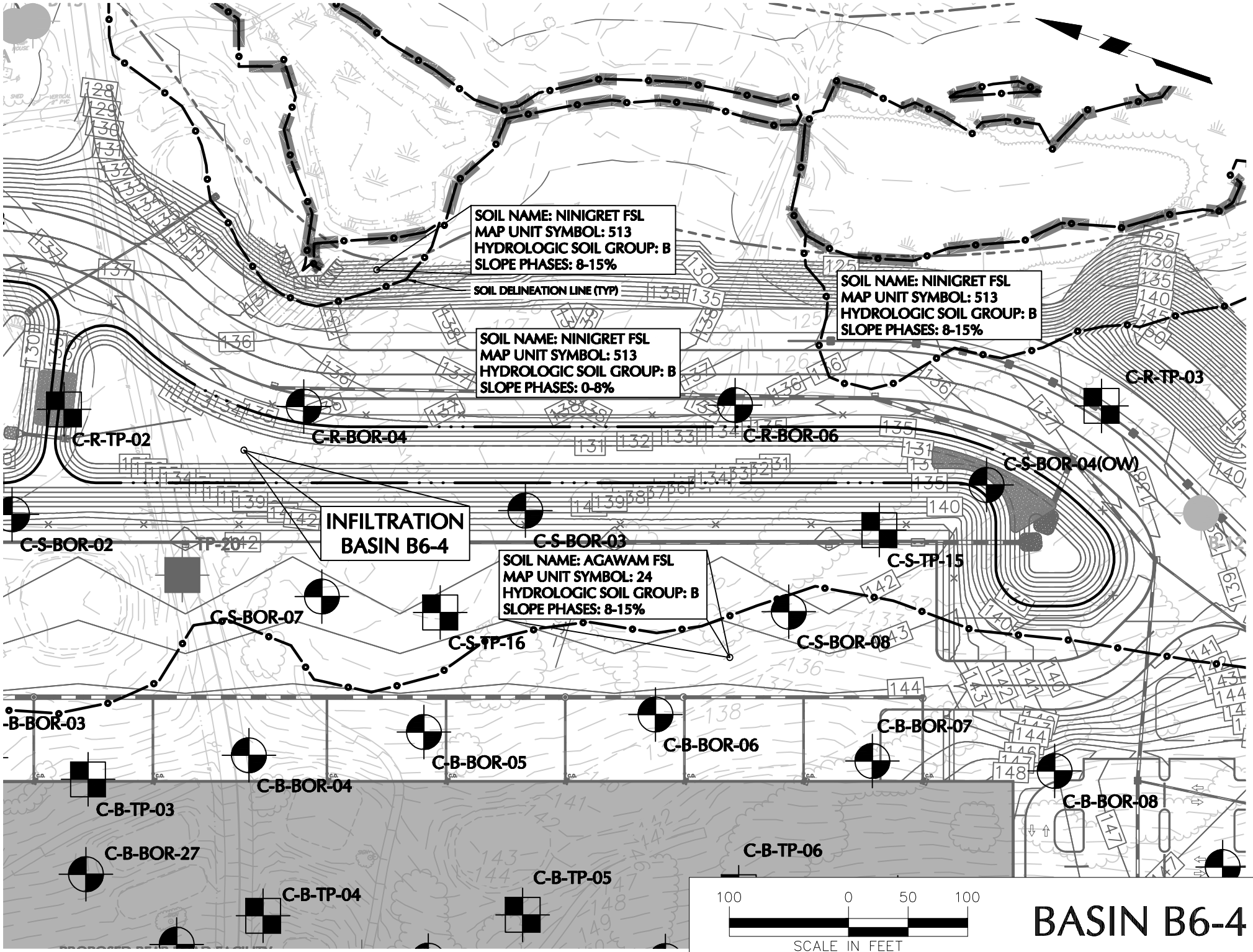

A-S-BOR-22
A-S-BOR-23
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 25%+
A-S-BOR-27
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 15-25%
A-S-BOR-31
A-S-BOR 35
INFILTRATION
BASIN A6-2
SOIL DELINEATION LINE (TYP)
A-S-TP-22
A-S-TP-21
A-S-TP-23
TEST PIT A-S-TP-21
SLOWEST OBSERVED RATE:
22.5
TEST PIT A-S-TP-22
SLOWEST OBSERVED RATE:
29.8
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
80
0
40
80
SCALE: 1 INCH = 80 FEET
BASIN A6-2


B-S-TP-18
B-S-TP-19
B-S-BOR-25
B-S-BOR-26
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
SOIL DELINEATION LINE (TYP)
B-S-BOR-28
B-S-TP-22
TEST PIT B-S-TP-22
SLOWEST OBSERVED RATE:
55.4
INFILTRATION
BASIN A11-2
B-S-TP-23
TEST PIT B-S-TP-23
SLOWEST OBSERVED RATE:
65.5
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 15-25%
TP-11
60 0 20 40 60
SCALE: 1 INCH = 60 FEET
BASIN A11-2


SOIL NAME: RAYPOL LFS
MAP UNIT SYMBOL: 540
HYDROLOGIC SOIL GROUP: D
SLOPE PHASES: 0-8%
INFILTRATION BASIN A11-3
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL NAME: POOTATUCK VFSL
MAP UNIT SYMBOL: 4
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 15-25%
SOIL DELINEATION LINE (TYP)
SOIL NAME: POOTATUCK VFSL
MAP UNIT SYMBOL: 4
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 25%+
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 25%+
40 0 10 25 40
SCALE: 1 INCH = 40 FEET
BASIN A11-3


TEST PIT A-S-TP-01
SLOWEST OBSERVED RATE:
26.7
TEST PIT A-S-TP-02
SLOWEST OBSERVED RATE:
29.4
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
A-R-TP-02
A-S-TP-01
A-S-TP-02
SOIL DELINEATION LINE (TYP)
INFILTRATION
BASIN B1-2
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
40 0 10 25 40
SCALE: 1 INCH = 40 FEET
BASIN B1-2


SOIL NAME: SCARBORO MUCK
MAP UNIT SYMBOL: 115
HYDROLOGIC SOIL GROUP: D
SLOPE PHASES: 0-8%
SOIL DELINEATION LINE (TYP)
TEST PIT C-R-TP-01
SLOWEST OBSERVED RATE:
11.3
C-R-BOR-02
C-S-TP-01
C-R-TP-01
C-R-BOR-03
INFILTRATION
BASIN B6-3
B-20 (OW)
C-S-BOR-01
C-S-BOR-05
C-S-BOR-06
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
C-B-BOR-02(OW)
B-14
C-B-BOR-01A
60 0 20 40 60
SCALE: 1 INCH = 60 FEET
BASIN B6-3


SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL DELINEATION LINE (TYP)
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 0-8%
SOIL NAME: NINIGRET FSL
MAP UNIT SYMBOL: 513
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
SOIL NAME: AGAWAM FSL
MAP UNIT SYMBOL: 24
HYDROLOGIC SOIL GROUP: B
SLOPE PHASES: 8-15%
INFILTRATION BASIN B6-4
C-R-TP-02
C-R-BOR-04
C-R-BOR-06
C-R-TP-03
C-S-BOR-04(OW)
C-S-BOR-02
C-S-BOR-03
C-S-TP-15
C-S-BOR-07
C-S-TP-16
C-S-BOR-08
C-B-BOR-03
C-B-BOR-04
C-B-BOR-05
C-B-BOR-06
C-B-BOR-07
C-B-TP-03
C-B-BOR-08
C-B-BOR-27
C-B-TP-04
C-B-TP-05
C-B-TP-06
100 0 50 100
SCALE IN FEET
BASIN B6-4

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INFILTRATION TESTS

A-IT-01 performed in A-S-TP-01

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/24/2020 to 6/25/2020
INSPECTOR	Olivia Chasse	**WEATHER**	Rain, 70s°F/Sunny, 80s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	14:10	24
End	14:36	2
	*presoak timing stopped at 2 inches due to heavy rain	

ELEVATION AND DATUM			
Surface Elevation	Approx.	135.5	(NGVD29)
Top of Hole Elevation	Approx.	130.5	(NGVD29)
Bottom of Hole Elevation	Approx.	128.5	(NGVD29)

METHOD OF INFILTRATION TEST

A-S-TP-01 was advanced to a depth of about 5 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain overnight. Timing for the presoak was stopped due to heavy rainfall and the infiltration testing hole was free of water the following morning prior to starting infiltration testing. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded.The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit A-S-TP-01 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown fine SAND, trace silt
	2460	0	2460	0.59	35.12	
				Average Rate:	**35.1**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown fine SAND, trace silt
	3240	0	3240	0.44	26.67	
				Average Rate:	**26.7**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown fine SAND, trace silt
	2460	0	2460	0.59	35.12	
				Average Rate:	**35.1**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown fine SAND, trace silt
	2880	0	2880	0.50	30.00	
				Average Rate:	**30.0**	**inches/hour**

Lowest Average Rate:	**26.7**	**inches/hour**

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INFILTRATION TESTS

A-IT-02 performed in A-S-TP-02

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/24/2020 to 6/25/2020
INSPECTOR	Olivia Chasse	**WEATHER**	Rain, 70s°F/Sunny, 80s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	13:00	24
End	13:16	4
	*presoak timing stopped at 4 inches due to heavy rain	

ELEVATION AND DATUM			
Surface Elevation	Approx.	133	(NGVD29)
Top of Hole Elevation	Approx.	130.0	(NGVD29)
Bottom of Hole Elevation	Approx.	128.0	(NGVD29)

METHOD OF INFILTRATION TEST

A-S-TP-02 was advanced to a depth of about 3 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoakedwith 24 inches of water and allowed to drain overnight. Timing for the presoak was stopped due to heavy rainfall and the infiltration testing hole was free of water the following morning prior to starting infiltration testing. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded.The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit A-S-TP-02 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown fine sandy SILT
	2340	0	2340	0.62	36.92	
				Average Rate:	**36.9**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown fine sandy SILT
	2460	0	2460	0.59	35.12	
				Average Rate:	**35.1**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown fine sandy SILT
	2940	0	2940	0.49	29.39	
				Average Rate:	**29.4**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown fine sandy SILT
	2880	0	2880	0.50	30.00	
				Average Rate:	**30.0**	**inches/hour**

Lowest Average Rate:	**29.4**	**inches/hour**

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INFILTRATION TESTS

A-IT-09 performed in A-S-TP-09

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	06/23/2020
INSPECTOR	Olivia Chasse	**WEATHER**	Sunny, 80s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**	**ELEVATION AND DATUM**			
Start	10:09	24	**Surface Elevation**	Approx.	132.5	(NGVD29)
End	10:19	5	**Top of Hole Elevation**	Approx.	132.5	(NGVD29)
	*presoak stopped at 5 inches due to silting at bottom		**Bottom of Hole Elevation**	Approx.	130.5	(NGVD29)

METHOD OF INFILTRATION TEST

An about 6-inch diameter, 24-inch deep hole was dug below surface grade, by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoakedwith 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain all 24 inches was recorded.The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit A-S-TP-09 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Grayish brown fine to medium SAND, some silt, trace fine gravel
	960	0	960	1.50	90.00	
				Average Rate:	**90.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Grayish brown fine to medium SAND, some silt, trace fine gravel
	1260	0	1260	1.14	68.57	
				Average Rate:	**68.6**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Grayish brown fine to medium SAND, some silt, trace fine gravel
	1380	0	1380	1.04	62.61	
				Average Rate:	**62.6**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Grayish brown fine to medium SAND, some silt, trace fine gravel
	1680	0	1680	0.86	51.43	
				Average Rate:	**51.4**	**inches/hour**

Lowest Average Rate:	**51.4**	**inches/hour**

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INFILTRATION TESTS

A-IT-15 performed in A-S-TP-15

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/5/2020
INSPECTOR	Taylor Sisti	**WEATHER**	Sunny, 70s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	13:24	24
End	13:27	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	137	(NGVD29)
Top of Hole Elevation	Approx.	134.5	(NGVD29)
Bottom of Hole Elevation	Approx.	132.5	(NGVD29)

METHOD OF INFILTRATION TEST

A-S-TP-15 was advanced to a depth of about 2.5 feet below existing grades. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoakedwith 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after every six inch drop to calculate the overall infiltration rate.The tables below outline the calculations for determining the average rate in which the water dissipated.Test pit A-S-TP-15 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Brown fine to medium SAND, trace silt
	20.6	18	20.6	17.48	1048.54	
	55.7	12	35.1	10.26	615.38	
	125.9	6	70.2	5.13	307.69	
	241.3	0	115.4	3.12	187.18	
				Average Rate:	**539.7**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Brown fine to medium SAND, trace silt
	15.9	18	15.9	22.64	1358.49	
	42.6	12	26.7	13.48	808.99	
	86.5	7	43.9	6.83	410.02	
	133.7	2	47.2	6.36	381.36	
				Average Rate:	**739.7**	**inches/hour**

NOTE: Bottom silted 2 inches, test ended when no water remained.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Brown fine to medium SAND, trace silt
	21.3	18	21.3	16.90	1014.08	
	64.3	12	43	8.37	502.33	
	174.5	6	110.2	3.27	196.01	
	313.5	1	139	2.16	129.50	
				Average Rate:	**460.5**	**inches/hour**

NOTE: Bottom silted 1 inch, test ended when no water remained.

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INFILTRATION TESTS

A-IT-15 performed in A-S-TP-15 (cont.)

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Brown fine to medium SAND, trace silt
	47.6	18	47.6	7.56	453.78	
	141.8	12	94.2	3.82	229.30	
	331.2	6	189.4	1.90	114.04	
	609.7	0	278.5	1.29	77.56	
				Average Rate:	**218.7**	**inches/hour**

Lowest Average Rate:	**218.67**	**inches/hour**

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INFILTRATION TESTS

A-IT-21 performed in A-S-TP-21

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/29/2020
INSPECTOR	Taylor Sisti	**WEATHER**	Cloudy, 70s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	8:52	24
End	9:39	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	115	(NGVD29)
Top of Hole Elevation	Approx.	114.0	(NGVD29)
Bottom of Hole Elevation	Approx.	112.0	(NGVD29)

METHOD OF INFILTRATION TEST

A-S-TP-21 was advanced to a depth of about 1 foot below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit A-S-TP-21 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown sandy SILT, trace fine gravel
	3300	0	3300	0.44	26.18	
				Average Rate:	**26.2**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown sandy SILT, trace fine gravel
	3600	1	3600	0.38	23.00	
				Average Rate:	**23.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown sandy SILT, trace fine gravel
	3600	1	3600	0.38	23.00	
				Average Rate:	**23.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown sandy SILT, trace fine gravel
	3600	1.5	3600	0.38	22.50	
				Average Rate:	**22.5**	**inches/hour**

Lowest Average Rate:	**22.5**	**inches/hour**

LANGAN

INFILTRATION TESTS

A-IT-22 performed in A-S-TP-22

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/29/2020
INSPECTOR	Taylor Sisti	**WEATHER**	Cloudy, 70s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	9:07	24
End	9:27	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	114	(NGVD29)
Top of Hole Elevation	Approx.	112.0	(NGVD29)
Bottom of Hole Elevation	Approx.	110.0	(NGVD29)

METHOD OF INFILTRATION TEST

A-S-TP-22 was advanced to a depth of about 2 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit A-S-TP-22 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown sandy SILT
	1665	0	1665	0.86	51.89	
				Average Rate:	**51.9**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown sandy SILT
	2065	0	2065	0.70	41.84	
				Average Rate:	**41.8**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown sandy SILT
	2557	0	2557	0.56	33.79	
				Average Rate:	**33.8**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown sandy SILT
	2902	0	2902	0.50	29.77	
				Average Rate:	**29.8**	**inches/hour**

Lowest Average Rate:	**29.8**	**inches/hour**

LANGAN

INFILTRATION TESTS

B-IT-22 performed in B-S-TP-22

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/29/2020
INSPECTOR	Olivia Chasse	**WEATHER**	Cloudy, 70s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	12:05	24
End	12:19	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	115	(NGVD29)
Top of Hole Elevation	Approx.	113.0	(NGVD29)
Bottom of Hole Elevation	Approx.	111.0	(NGVD29)

METHOD OF INFILTRATION TEST

B-S-TP-22 was advanced to a depth of about 2 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit B-S-TP-22 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown to brown fine SAND, some fine to coarse gravel, trace silt, trace cobbles
	960	0	960	1.50	90.00	
				Average Rate:	**90.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown to brown fine SAND, some fine to coarse gravel, trace silt, trace cobbles
	1380	0	1380	1.04	62.61	
				Average Rate:	**62.6**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown to brown fine SAND, some fine to coarse gravel, trace silt, trace cobbles
	1380	0	1380	1.04	62.61	
				Average Rate:	**62.6**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown to brown fine SAND, some fine to coarse gravel, trace silt, trace cobbles
	1560	0	1560	0.92	55.38	
				Average Rate:	**55.4**	**inches/hour**

Lowest Average Rate:	**55.4**	**inches/hour**

LANGAN

INFILTRATION TESTS

B-IT-23 performed in B-S-TP-23

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/29/2020
INSPECTOR	Olivia Chasse	**WEATHER**	Cloudy, 70s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	12:40	24
End	12:50	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	115.5	(NGVD29)
Top of Hole Elevation	Approx.	115.5	(NGVD29)
Bottom of Hole Elevation	Approx.	113.5	(NGVD29)

METHOD OF INFILTRATION TEST

An about 6-inch diameter, 24-inch deep hole was dug below surface grade, by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit B-S-TP-23 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown fine to coarse SAND, trace silt, trace fine gravel
	960	0	960	1.50	90.00	
				Average Rate:	**90.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown fine to coarse SAND, trace silt, trace fine gravel
	1320	0	1320	1.09	65.45	
				Average Rate:	**65.5**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown fine to coarse SAND, trace silt, trace fine gravel
	1080	0	1080	1.33	80.00	
				Average Rate:	**80.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown fine to coarse SAND, trace silt, trace fine gravel
	1200	0	1200	1.20	72.00	
				Average Rate:	**72.0**	**inches/hour**

Lowest Average Rate:	**65.5**	**inches/hour**

LANGAN

INFILTRATION TESTS

C-IT-01 performed in C-S-TP-01

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/17/2020 to 6/18/2020
INSPECTOR	Taylor Sisti	**WEATHER**	Sunny, 80s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	11:44	24
End	13:00	1.5
	*presoak allowed to continue overnight	

ELEVATION AND DATUM			
Surface Elevation	Approx.	127.5	(NGVD29)
Top of Hole Elevation	Approx.	125.5	(NGVD29)
Bottom of Hole Elevation	Approx.	123.5	(NGVD29)

METHOD OF INFILTRATION TEST

C-S-TP-01 was advanced to a depth of about 2 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain overnight. The infiltration testing hole was free of water the following morning prior to starting infiltration testing. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit C-S-TP-01 was advanced to to termination depth following completion of the infiltration test. Groundwater was encountered at about 7.1ft below grade.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown sandy SILT
	3600	12.75	3600	0.19	11.25	
				Average Rate:	**11.3**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown sandy SILT
	3600	12	3600	0.20	12.00	
				Average Rate:	**12.0**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown sandy SILT
	3600	12.5	3600	0.19	11.50	
				Average Rate:	**11.5**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown sandy SILT
	3600	12	3600	0.20	12.00	
				Average Rate:	**12.0**	**inches/hour**

Lowest Average Rate:	**11.3**	**inches/hour**

LANGAN

INFILTRATION TESTS

C-IT-17 performed in C-S-TP-17

PROJECT	Project Hudson	**PROJECT NO.**	151010101
LOCATION	59 Steele Road, Hudson, NH	**DATE**	6/17/2020
INSPECTOR	Taylor Sisti	**WEATHER**	Sunny, 80s°F

PRESOAK	**TIME**	**DEPTH OF WATER IN HOLE (INCH)**
Start	14:59	24
End	15:13	0

ELEVATION AND DATUM			
Surface Elevation	Approx.	133	(NGVD29)
Top of Hole Elevation	Approx.	132.5	(NGVD29)
Bottom of Hole Elevation	Approx.	130.5	(NGVD29)

METHOD OF INFILTRATION TEST

C-S-TP-01 was advanced to a depth of about 0.5 feet below existing grade. An about 6-inch diameter, 24-inch deep hole was dug by hand with a post hole digger. The circumfrence of the hole was then lined with a 6-inch diameter, 30-inch long PVC pipe. Before running infiltration tests, the hole was presoaked with 24 inches of water and allowed to drain. For each infiltration test, the hole was filled with water to a predetermined depth of 24 inches. Then, the time was recorded after one hour or the time for the water to drain 24 inches was recorded. The tables below outline the calculations for determining the average rate in which the water dissipated. Test pit C-S-TP-17 was advanced to to termination depth following completion of the infiltration test.

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 1	0	24	-	-	-	Light brown sandy SILT
	711	0	711	2.03	121.52	
				Average Rate:	**121.5**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 2	0	24	-	-	-	Light brown sandy SILT
	957	0	957	1.50	90.28	
				Average Rate:	**90.3**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 3	0	24	-	-	-	Light brown sandy SILT
	1082	0	1082	1.33	79.85	
				Average Rate:	**79.9**	**inches/hour**

	TIME (SEC)	DEPTH OF WATER (IN)	TIME INTERVAL (SEC)	RATE (IN/MIN)	RATE (IN/HOUR)	SOIL CONDITIONS
TEST 4	0	24	-	-	-	Light brown sandy SILT
	1091	0	1091	1.32	79.19	
				Average Rate:	**79.2**	**inches/hour**

Lowest Average Rate:	**79.2**	**inches/hour**

APPENDIX N

Construction Inspection and Maintenance Manual

INSPECTION AND MAINTENANCE MANUAL

for

Hudson Logics Center
43 Lowell Road
Hudson, New Hampshire

Prepared For:

Hillwood Enterprises, L.P.
5050 w. Tilghman Street, Suite 435
Allentown, PA 18104

Prepared By:

Langan Engineering & Environmental Services, Inc.
888 Boylston Street, Suite 510
Boston, MA 02199

Timothy D. O'Neill, P.E
New Hampshire Professional Engineer No. 16259

John D. Plante, P.E.
New Hampshire Professional Engineer No. 14072

August 2020
Langan Project No. 1510101

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1 MANUAL INTRODUCTION

This manual was designed in line with the Chapter Env-Wq 1500 Alteration of Terrain of the "New Hampshire Code of Administrative Rules" and the "New Hampshire Stormwater Manual" to address stormwater management on site. In initial threat to stormwater pollution from the proposed development is pollution caused by soil erosion and sedimentation during construction. Future potential sources of pollution are caused by the use and operation of the site after construction is completed. This manual focuses on the soil erosion and sediment control phase of inspections and maintenance through the construction period. A separate Operations and Maintenance Manual can be found for the long-term operation of the facilities as an appendix to the stormwater management report.

The general contractor for the development employed through Hillwood Enterprises, L.P. will be responsible for the implementation of this manual. The general contractor will be responsible for installation and maintenance of soil erosion and sediment control features. Additionally, they will in

2 BACKGROUND

This construction phase inspection and maintenance manual has been prepared in support of the proposed development of a 367.4 acre site located at 43 Steele Road in the Town of Hudson New Hampshire. The existing two parcel site is currently developed as a 39 hole golf course known as Green Meadow Golf Club and is accessed from Steele Road. The existing topography on the site exhibits significant grade changes of up to 90 feet in elevation. Many high and low points, and rolling topography can be found on site.

The proposed development is the construction and operation of three distribution warehousing facilities known collectively as the Hudson Logistics Center. Three Lots A, B, and C and a subdivision road way will be create from the existing two parcel site. Lot A will include the construction of a ±1,079,700 sf building with a finished floor elevation ±142.75 feet, Lot B will include the construction of a ±923,600 sf building with a finished floor elevation of ±146.5 ft, and Lot C will include the construction of a ±522,000 sf building with a finished floor elevation ±147.50 feet. The current access from Steel road is unable to support the facilities as the main access road. A right of way will be created and new access road constructed for the development. A secondary access is also proposed in the north east section of Lot A. Upgraded utility service lines will be brought to the site within the proposed right of way.

It is the purpose of this inspection and maintenance manual to insure the effective and continued operation of the proposed soil erosion and sediment control features through

the construction phase of this development. The proposed features can be seen in the attached appendices, design documents entitled "Hudson Logistics Center – Site Plan & Wetlands Conditional Use Applications" dated May 21, 2020 by Langan Engineering & Environmental Services, Inc. All erosion control measures are to be installed in line with the New Hampshire Department of Environmental Services Stormwater Manual.

3 CONSTRUCTION PHASING

Due to the complexities of construction sequencing on a project of this magnitude, a general contractor would need to outline specific details of scheduling based on their personal approach. As a general contractor has not been chosen for the development at this stage in the permitting process, a rough three phased construction sequence identifying major construction actives has been outlined below. The schedule below is subject to change based on input from the general contractor, availability of materials and final permitting approval.

Phase 1

Quarter 3 2020

- Install phase 1 Soil Erosion and Sediment control Measures
- Install construction and demolition staging areas
- Utility and services disconnect
- Establish temporary services
- Site demolition, clearing and grubbing

Quarter 4 2020

- Install and construction Northeastern stream crossing

Phase 2

Quarter 4 2020

- Install phase 2 Soil Erosion and Sediment control Measures
- Mass earthwork and rough grading
- Retaining wall construction
- Building pad construction

Quarter 4 2020 / Quarter Q1 2021

- Begin construction on proposed Right of Way

Phase 3

Quarter 2 2021

- Install phase 3 Soil Erosion and Sediment control Measures
- Stormwater conveyance system and utility installation
- Building construction
- Paving and landscaping installation
- Final site stabilization

Quarter 3 2021

- Certificate of Occupancy
- Removal of Soil Erosion and Sediment Control features

4 SOIL EROSION AND SEDIMENT CONTROL FEATURES

During construction the three phased soil erosion and sediment control measures outlined in the CE Series of the design documents will be implemented. The design includes the following features:

1. Construction Entrances – A temporary 12" thick, 23' wide by 75' long, stone pad construction entrance will be installed as shown in Soil Erosion and Sediment Control Plans. It may be necessary to clean vehicle tires at this location.
2. Perimeter Controls - Placed along the toe of erosion prone slopes, inlets or adjacent to sensitive areas. Typically, these features are places in down grading areas, parallel to the topography as to avoid channelization.
    a. Silt Fencing – Filters sediment suspended in run off.
    b. Fiber Rolls – Filters sediment suspended in run off with a high flow through rate.
    c. Compost Filter Tubes – Filters sediment suspended in run off with a high flow rate. Has a higher filtration rate and sediment storage capacity than filer tubes. Specific types of compost can also provide pollutant removal from run off and are to places along the border of down gradient, high run off sensitive areas such as wetlands.
3. Inlet Protection – Silt fencing, composite filter tube, and silt sacks shall be used at all catch basins and drainage inlets upon start of work or immediately after installation and remain until all disturbed area surrounding the inlets are stabilized.
4. Run off Protection – to provide flow attenuation and settlement of suspended solids before leaving the site.
    a. Diversion Channels – Used to intercept and divert flows to temporary treatment controls for sediment laden run off.
    b. Sediment Basins – A water impoundment constructed to capture and store sediment and/or debris.
    c. Sediment Traps – A small, temporary ponding area to intercept sediment-laden runoff from small disturbed areas.
5. Surface Stabilization
    a. Erosion Control Blankets – To be placed on steep and highly erodible slopes during construction.
    b. Surface Roughening - Groove slope by cutting furrows along the contour, creating irregularities in the soil surface to catch rainwater and retain lime, fertilizer, and seed.
    c. Mulching and/or Temporary Seeding – Areas should be mulched immediately following seeding. Areas within 100 feet of streams, wetlands and in lake watersheds should be mulched within seven days of exposing soil or prior to

storm event. Temporary vegetation cover should be applied where exposed soil surfaces will not be final graded within 45 days from initial disturbance.

d. Permanent Seeding – Permanent vegetation is to be seeded or sodded on all exposed areas within ten days after final grading. Mulch as necessary for seed protection and establishment. Lime and fertilize prior to permanent seeding.

6. Stock Pile Locations – Silt fencing and composite filter tube shall be installed around stockpiles immediately upon stockpiling materials. These should not be removed until the stockpile is stabilized or removed. Side slopes shall be seeded or stabilized with erosion control mats if not disturbed for thirty days. Designated locations for stockpiling materials with appropriate perimeter control measure are identified in the design documents. These locations are sited to avoid impact to sensitive areas if erosion takes place.
7. Dust Control – Dust shall be controlled by sprinkling or other approved method. The contractor is responsible for all paved roadways, on and off-site, which must be kept free of site-generated sediment at all times. All areas within 500 feet of an inhabited dwelling shall be wetted as necessary to provide dust control.
8. Check Dams – Dam constructed across a swale to counteract erosion by reducing water velocity.
9. Street Sweeping – If offsite tracking or sediment from the development is observed in the roadways, street sweeping will be performed as required.
10. Storage – The contractor will be responsible for proper storage of any materials, such as chemicals, fluids (fuel, oils, etc.) waste materials, etc. These storage procedures must be designed to ensure pollutants are not discharged into any waters of the State of New Hampshire.

5 STORMWATER POLLUTION CONTROL FEATURES

The following measures will be taken during the construction of the development to address potential pollutants:

1. Stabilization – Reduces the ability for pollutants to travel of site with eroded materials.
    a. Vegetation – Vegetation filters pollutants out of stormwater as it flows overland.
2. Structural Practices– Provides control for run off during construction period.
    a. Soil Stockpile protection – Protects highly erodible, unstable, recently disturbed materials in place on site.
    b. Inlet Protection – Prevents pollutants such as trash from entering the conveyance system.
    c. Perimeter Controls – Prevents trach from leaving the site. Some perimeter controls may include a pollutant removal filtering capacity.

d. Sediment Trap – Provides a location for run off from construction areas up to 5 acres. Designed with a specific volume based off of the site conditions, run off resides here to settle suspended solids before being discharged downstream.
e. Sediment Basin – Provides a location for run off from construction areas up to ± 40 acres. Designed with a specific volume based off of the site conditions, run off resides here to settle suspended solids before being discharged downstream.
f. Diversion Channel – Intercepts run off flows which may contain suspended solids or pollutants and directs them to a safe location or other feature.
g. Check Dams – Dam constructed across a swale to counteract erosion by reducing water velocity.
h. Oil/Water Separators – The primary function of these units is to isolate and store any potential gasoline or oil leaks prior to discharging flow into a downstream stormwater network. The units have been sized to accommodate the first flush, or initial surface runoff, of rainfall which is equal to one inch of runoff over each contributing area. The first flush was chosen as this runoff is most likely to contain a more concentrated portion of contaminants than the rest of the storm. Each unit also contains an overflow bypass to allow runoff past the first flush to efficiently travel through the system.

3. Stormwater Management – Construction stormwater runoff will be managed by the above features. Long term operation and maintenance of the facility's stormwater management system can be found in the report entitled "Stormwater Management Report" dated May 2020 by Langan Engineering & Environmental Services, Inc. in attached appendices.
4. Sanitary – Portable sanitary units will be on site for all workers to use through the construction phase of the project. Licensed sanitary waste management contractors will regularly remove waste from the portable units.
5. Waste – Site general contractor will be responsible for all trash and construction debris from the site. It will be taken to an approved location. No waste will be buried on site and all lose waste will be collected to avoid floating during runoff events.
6. Regulatory Compliance – The project has been designed in accordance with local, state and federal guidelines. Inspection schedules, notifications and clos out procedures will be adhered to.

6 MAINTENANCE

Soil erosion and sediment control measures should be checked weekly as well as after all rainfall events of at least 0.5 inches. Any repairs should be made immediately

to maintain all measures that were designed. More about inspections is discussed in section 8.

Maintenance for devises called out in the plans include:

1. Silt Fences and Fiber Rolls – Sediment must be removed from the upstream side of the silt fence (or other erosion control device) once the depth of the collected sediment reached a third the height of the silt fence.
2. Inlet Protection – Any sediment within a siltsack will be removed and properly disposed of.
3. Disposal of Sediment – The owner's soil engineer shall determine how to dispose of any collected sediment.
4. Temporary Measure – All temporary measures will only be removed once disturbed area is fully stabilized and all construction activities have concluded.
5. Sediment Traps – Should be cleaned out once sediment has accumulated to 50% of its original volume. If geotextile fabric or stone used around a pipe-outlet riser should be checked periodically and replaced when the material has become clogging with sediment.
6. Sediment Basins – Water discharged from sediment basins should be monitored during storm events to determine how well they are functioning and if sedimentation is apparent, additional erosion control measures should be applied to eliminate sedimentation. Sediment should be removed and restored to original capacity when sediment has accumulated to the original design sediment storage volume (this may not be the total volume of the basin). If geotextile fabric or stone used around a pipe-outlet riser should be checked periodically and replaced when the material has become clogging with sediment,
7. Diversion Channels – The channel must be stabilized immediately following installation to prevent erosion of diversion itself. Should not be steep enough to cause erosion due to high velocity channel flow. If this occurs, corrective action should be taken to stabilize the channel and berm. Should be cleaned out after every significant storm and any damages caused by a storm or construction must be repaired by the end of the workday.
8. Check Dam – Should be inspected after each rainfall and at least daily during prolonged rainfall and necessary repairs should be made immediately. The center of the dam should remain lower than the edges. Sediment accumulation should be checked for and removed once it reached half of the original height.
9. Oil/Water Separator – Oil water separators to be inspected, at a minimum, immediately after completion of the site's construction, every 6 months for the first year of operation, and annually after the end of the first year. Remove

sediment accumulation and floatables as required. Dispose of sediment and floatables in an environmentally acceptable manner.

10. Construction Entrance/Exit – When the control pad becomes ineffective, the stone and collected soil should be removed, regraded on site, and stabilized, then reconstructed. The pavement at exits should be swept whenever soil material is tracked onto adjacent pavement or travelled way. Wheel washing should be conducted on an area stabilized with aggregate, which drains to an approved sediment-trapping device. Sediment should be prevented from entering storm drains, ditched, and waterways.

7 SPILL PREVENTION AND RESPONSE

Workers must follow basics for spill prevention, as well as specifics for certain materials. If a spill does occur, workers on site must follow procedures in this section.

1. Basics
    a. Quantity of Material - Only keep enough material on site that you need.
    b. Excavated Material – All soil not to be used for final grading/landscaping shall be removed from the site immediately, in accordance with applicable state and local law.
    c. Storage – All materials should be stored in appropriate containers and covered. If covering is not possible, the material must be covered with polyethylene or polypropylene sheeting.
    d. Label Products – Products will be stored with their original label from their manufacturer affixed in a legible way, to each container.
    e. Mixing – Products will only be mixed if recommended by manufacturer.
    f. Disposal – Products will try to be used entirely from each container prior to the disposal of container. Manufacturer's recommendations for proper disposal will be followed.
    g. Inspections – Site superintendent will do daily site inspections to insure proper storage, labeling and disposal of materials.
2. Specific Products
    a. Concrete – Concrete trucks will not wash out, discharge concrete, or drum wash water anywhere onside that could potentially reach a storm drainage system, waterway, or wetland. If washing occurs onsite, a sump basin is recommended and should be reinforced with silt fencing.
    b. Fertilizers – Fertilizer must be stored in a covered area, with any partially used bags stored in a sealed plastic bin. Fertilizer will only be applied in

the minimum amounts based off manufacturer's recommendations, and will be worked into the soil when applied to avoid runoff.

c. Paints – Containers will be clearly labeled, tightly sealed, and neatly stored. All extra paint will be disposed of based of manufacturer's recommendations.
d. Petroleum Products – All vehicles onsite will be monitored for leaks and will regularly receive maintenance to reduce chance of leaks. Products must be labeled clearly and stored in tightly sealed containers or offsite. All asphalt substances used onsite will be applied according to the manufacturer's recommendations.

3. Spill Response
    a. Awareness and Materials – General contractor will inform all site personnel aware of all procedures, where all required materials are for clean-up. Required materials include shovels, brooms, rags, goggles, gloves, absorbent materials (sawdust, sand, etc.), and plastic/metal containers specifically there for this purpose. The materials needed will be present on site at all times.
    b. Response Time – Spills will be cleaned up immediately.
    c. Safety – The area the spill occurred in will be kept ventilated, and workers in the area will wear appropriate personal protective equipment.

Reporting – If the spill is toxic or hazardous, it must be reported to the appropriate state or local government agency, regardless of the size of the spill. The spill prevention plan will then change to prevent injury/contact with the toxic/hazardous substance.

8 INSPECTION

Qualified personnel will inspect locations where vehicles enter/exit the site, as well as any area not stabilized during construction, and all structural control measures. These inspections will occur within 24 hours of a 0.5-inch or greater storm event, and at least every seven-calendar days. The qualified person must also ensure that all soil erosion and sediment control featured are properly installed and maintained on the construction site before predicted major storms. A major storm is defined as a storm predicted by the National Office of Atmospheric Administration Weather Service with warnings of flooding, severe thunderstorms or similarly severe weather conditions or effects.

The contractor is responsible for ensuring inspections are performed, recorded, and if necessary, corrected. Inspections include:

1. Construction Entrances/Exits – Vehicle Entrances/Exits will be checked for effectiveness, to ensure sediment is not being carried off-site.
2. Stabilization – Disturbed areas and storage areas that are exposed to rainfall must be inspected for evidence of or the potential for pollution and erosion.
3. Structural Controls – Silt fences, fiber rolls, siltsacks, etc. must be checked for proper anchoring, positioning, that they are trapping sediment, and if they need to have sediment or other debris removed.
4. Sediment Traps, Sediment Basins – Check to see if sediment has been building up within trap/basin. If sediment has built up in trap above 50% of its volume, do appropriate maintenance. If sediment is building up in basin, do appropriate maintenance. If geotextile fabric or stone used around a pipe-outlet riser should be checked periodically and replaced when the material has become clogging with sediment.
5. Diversion Channels – This measure should be used immediately above a new cut or soil fill slope or around the perimeter of a disturbed area. Check for erosion of channel itself. If this is occurring, channel must be repaired and the slope decreased if necessary.
6. Check Dam – Should be inspected after each rainfall and at least daily during prolonged rainfall and necessary repairs should be made immediately. The center of the dam should remain lower than the edges. Sediment accumulation should be checked for and removed once it reached half of the original height.
7. Oil/Water Separator – Oil water separators to be inspected, at a minimum, immediately after completion of the site's construction, every 6 months for the first year of operation, and annually after the end of the first year. Remove sediment accumulation and floatables as required. Dispose of sediment and floatables in an environmentally acceptable manner.
8. Discharge – Location of discharge from the site must be checked to make sure soil erosion and sediment control measures are being successful in preventing significant amounts of pollution and sediment.

The qualified site inspector will complete a field report for each site inspection. A copy of the field report will be included in this manual (which remains on site), as well as sent to the owner, owner's representative, and the general contractor. Any recommendations/ changes to the Stormwater Pollution Control Plan shall be revised immediately, and any modifications on site should be completed by the contractor within three days following the site visit. Any changes made to the Soil Erosion and Sediment Control Plans should be noted in the field report. A sample inspection form is shown as Tables 4.

The field report must be completed and signed by the field inspector in charge of soil erosion and sediment control and kept in this manual table.

Before construction begins, the project representative must meet with the Town of Hudson's Enforcement Officer to discuss and agree on the method of installation and maintenance of the soil erosion and sediment control measures. The project representative is responsible for contacting the Town of Hudson's Enforcement Officer to perform on-site inspections. Construction cannot start or continue without the Enforcement Officer's approval. The project representative shall be responsible for ensuring compliance with all aspects of this manual and informing the enforcement officers or any responsible party during construction. The soil erosion and sediment control measures must only be removed once full site stabilization is complete and a receipt of authorization form the Town of Hudson's Enforcement Officer has been received.

9 COMPLETION OF PROJECT

Once the project is complete, and the site is stabilized, the owner is responsible for inspecting and maintenance of the stormwater systems. Inspections should be done twice a year, once in the fall after the leaves have fallen from the trees and another in the spring once all the snow melts. The owner should look for a buildup of sediment in infiltration basins and catch basins as well as checking the site for erosion projects that may have occurred. Some maintenance may be required once inspection is complete (vacuuming and cleaning infiltration basins and catch basins). For a full description of inspection and maintenance procedures for the long term operation and maintenance of these facilities, refer to the report entitled "Stormwater Management Report" dated May 2020 by Langan Engineering & Environmental Services, Inc. in attached appendices.

10 CONTRACTORS

This manual identifies site contractors and subcontractors, which may have the potential to cause pollution of the waters of the State of New Hampshire. Each such contractor and subcontractor shall sign a copy of the certification statement shown below. (See Table 3 for blank form). A copy of such certifications shall be maintained on site during construction.

"I certify under penalty of the law that I have read and understand the terms and conditions of the general permit for the discharge of stormwater associated with construction activity. I understand that as a contractor or subcontractor at the site, I am covered by this general permit, and must comply with the terms and conditions of this permit, including but not limited to the requirements of the stormwater pollution control plan prepared for the site."

_____	_____
Name	Title
_____	_____
Contractor Name	Address
_____	_____
Site Telephone	Office Telephone
_____	_____
Emergency (24 hour) Telephone	Date

11 REFERENCES

A copy of this manual must remain on-site from the day construction begins until the day construction is completed.

A copy of the Stormwater Pollution Plan and inspection reports required by the general permit shall be retained for a period of at least three years from the date that construction is complete.

TABLE 1

GENERAL SITE INFORMATION

A. Location of Site:

Lowell Road
Hudson, New Hampshire

B. Landowner:

Green Meadow Golf Club, Inc. – Friel (Lots 239/1 & 234/34)
55 Marsh Road
Hudson, New Hampshire

C. Name and Address of General Contractor:

_____

_____

_____

Telephone: _____

Name and Address of Emergency Contact:

_____

_____

_____

Telephone: _____

D. Site Contact (Project Representative):

Name: _____

Telephone: _____

TABLE 2

SUB-CONTRACTORS

Name and Address of General Contractor:

A. _____

_____

_____

Telephone: _____

Site Contact and Telephone: _____

B. _____

_____

_____

Telephone: _____

C. _____

_____

_____

Telephone: _____

D. _____

_____

_____

Telephone: _____

TABLE 3

CONTRACTOR CERTIFICATION FOR
STORMWATER POLLUTION PREVENTION ACTIVITIES

"I certify under penalty of the law that I have read and understand the terms and conditions of the Alteration of Terrain permit for the discharge of stormwater associated with construction activity. I understand that as a contractor or subcontractor at the site, I am covered by this general permit, and must comply with the terms and conditions of this permit, including but not limited to the requirements of the stormwater pollution control plan prepared for the site."

_____	_____
Name	Title
_____	_____
General Contractor	Address
_____	_____
Site Telephone	Office Telephone
_____	_____
Emergency (24 hour) Telephone	Date

TABLE 4

SOIL EROSION AND SEDIMENT CONTROL INSPECTION CHECKLIST

Inspector: _____ Date: _____

Weather: _____ Time: _____

Site Feature	**Is There a Problem**	**Notes (What is the issue/Who will be notified)**
Inlet Protection		
Perimeter Controls		
Vegetation		
Soil Stockpiles and Sediment Traps		
Discharge Locations		
Diversion Swales		
Sediment Basins		
Hazardous Materials		
Exposed Material		
Exposed Soil		

Waste Management		
Construction Entrance/Exits		
Dust Control		
Check Dam		
Oil/Water Separators		
Other		

Corrective action taken while on site?

SIGNATURE: _____ **SIGNATURE:** _____

General Contractor On-Site Agent